

Commercial **F**ertilizer

and PLANT FOOD INDUSTRY

SEPTEMBER 1955

YEAR BOOK



**Products
for
Profitable
Farming**

Also made
by Nitrogen Division
PROCADIAN*
UREA
FEED MIXTURE

*Trade-mark

NITROGEN SOLUTIONS

AMERICAN NITRATE OF SODA

A-N-L® NITROGEN FERTILIZER

UREA 45 FERTILIZER

SULPHATE OF AMMONIA

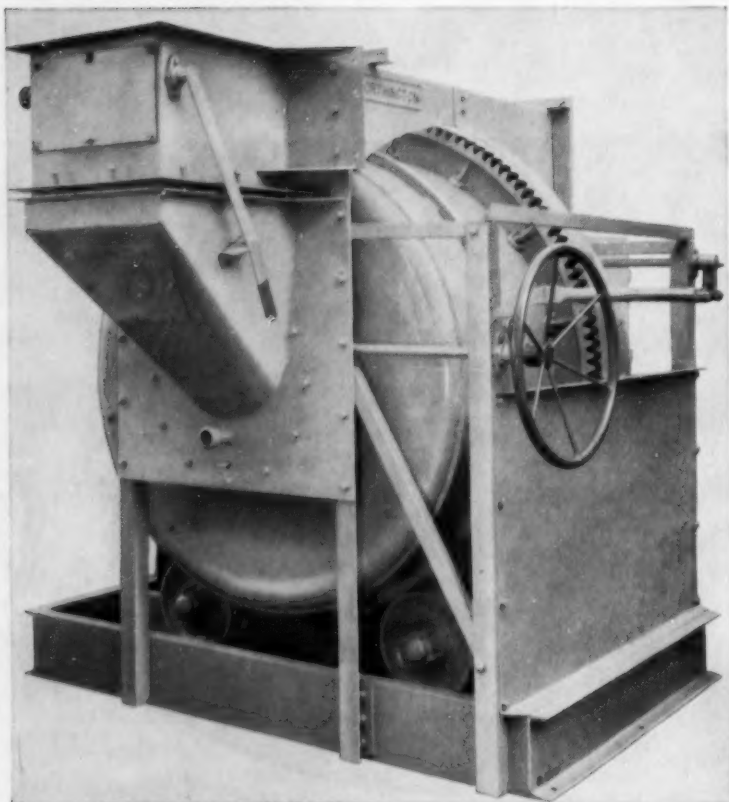
ANHYDROUS AMMONIA

NITROGEN DIVISION

Allied Chemical & Dye Corporation

New York 6, N.Y. • Hopewell, Va. • Ironton, Ohio
Indianapolis 20, Ind. • Columbia 1, S.C. • Omaha 7, Neb. • Kalamazoo, Mich.
Atlanta 3, Ga. • Columbia, Mo. • San Francisco 3, Cal. • Los Angeles 5, Cal.





Want a
MIXER
that works
faster?

and we mean
fast— 60 seconds
to be precise!

That's the kind of high-speed mixing action you get *only* with a Worthington industrial mixer. It can increase daily output as much as 10%.

Faster mixing action isn't all the Worthington mixers offer. Look at these extras:

- **SELF-CLEANING.** The blade arrangement and the correct angle between blade and drum shell make Worthington drums self-cleaning. Automatic hammer attachments available for sticky batches.
- **NO MOVING PARTS IN CONTACT WITH BATCH.** Exclusive with Worthington, this feature is especially important with corrosive mixtures.

- **FLAME-HARDENED DRUM TIRES.** Say goodbye to wobbly drum. Drum tires are of locomotive-tire steel, machined concentric and flame-hardened. Worthington rollers are genuine carwheels, ground to close tolerances.

Add to that Worthington's coast-to-coast sales and service organization — ready to give you a helping hand with all your mixing problems. No matter what you're mixing, it'll pay you to see your local Worthington man. Or write today to Worthington Corporation, Industrial Mixer Division, Plainfield, New Jersey.

VR.51

WORTHINGTON



INDUSTRIAL MIXERS



HOW TO MAKE QUALITY FERTILIZER

PUT SOME IN!

SMIROW, 100% natural organics, 90% water insoluble and 90% available, is a high quality source of nitrogen. SMIROW in your formula adds quality to your product . . . quality your customers can see. The dark particles of SMIROW are plainly visible in mixed fertilizers. And your salesmen will be proud to point them out!

Put quality into your formula if you would turn out a quality product . . . the kind that makes your fertilizer business grow, as well as your customers' crops.

Write, phone or wire today for samples and prices.



**SMIROW
TANKAGE**

MAKES PLANTS GROW



SMITH-ROWLAND COMPANY
NORFOLK, VIRGINIA • GRANITE CITY, ILLINOIS

more and more
granulated
fertilizer manufacturers
are turning to
LOUISVILLE rotary dryers
rotary coolers
to speed production...reduce drying costs



Installations are individually engineered for your problems. Results can be pre-determined in our pilot plant. We'll be glad to show you how the fertilizer industry has found a new way to efficient and profitable drying.

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TRIPLE SUPERPHOSPHATE

- 1. RUN-OF-PILE FOR MAXIMUM AMMONIATION**
- 2. GRANULAR FOR DIRECT APPLICATION**
- 3. PROMPT SERVICE TO MEET EVERY REQUIREMENT**

The source of superior phosphate fertilizers for nearly 30 years, U. S. Phosphoric Products is your ideal source for quality and dependability in Triple Superphosphate. Your Bradley & Baker sales representative will be glad to help you plan your shipments for maximum satisfaction.
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YEAR BOOK

1955
EDITION



Published by

WALTER W. BROWN
PUBLISHING CO., INC.

75 Third St., N. W., Atlanta 8, Georgia
Phone Atwood 4160

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Address all correspondence to Atlanta Publishing Offices, sending direct to COMMERCIAL FERTILIZER and PLANT FOOD INDUSTRY, 75 Third St., N. W., Atlanta 8, Georgia.

Vol. 91 No. 3A

Established 1910

September, 1955

Commercial Fertilizer and PLANT FOOD INDUSTRY

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COMMERCIAL FERTILIZER and Plant Food Industry, entered as second class matter, October 12, 1910, at the post office at Atlanta, under the Act of March 3, 1879. Published monthly except semi-monthly in September, by Walter W. Brown Publishing Co., Inc., 75 Third St., N. W., Atlanta 8, Georgia.

the
invisible
wall

There's an extra wall in CPC Multi-wall bags. You don't see it . . . but you realize it's there; shielding your product, your company, and your profits. It's added protection from delays . . . dissatisfied customers . . . shipping losses.

When you ship in CPC Multiwalls, you know you are protected by the additional wall of INTEGRITY, EXPERIENCE, QUALITY and SERVICE.



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“’Tis Better to Be 3 Hours Too Soon Than a Minute Too Late”



Albemarle anticipated your order for Multiwall Bags many years ago when it planted the seedling pines in its own forest preserves. Albemarle's is a completely integrated operation from woodlot to eye-catching designs printed in color on sturdy plain or colored Kraft.

You benefit by prompt deliveries, quickly shipped, that have been completely controlled by Albemarle all the way.



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USS Ammonium Sulphate

year-round, all-around fertilizer

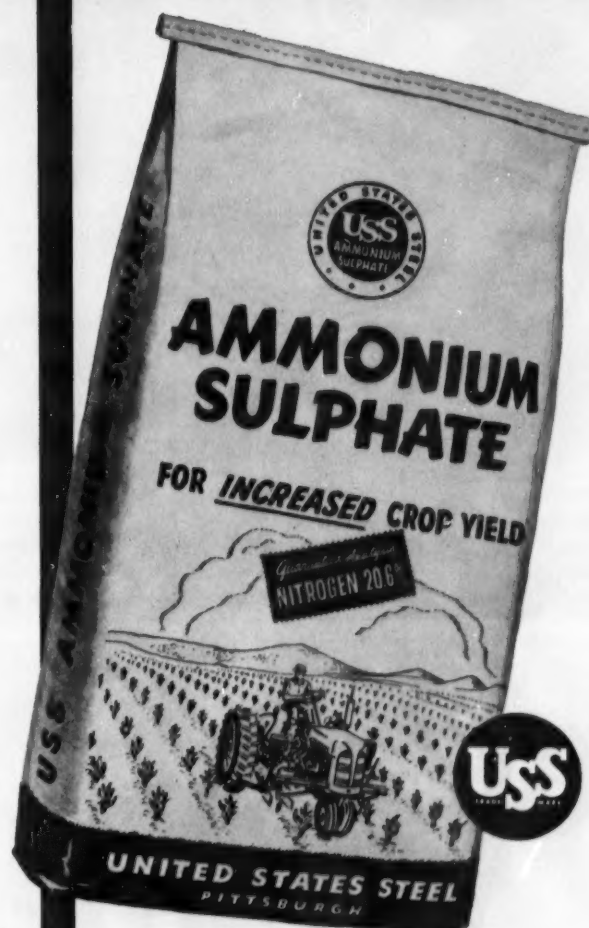
Nitrogen is an all-important growth element necessary to maximum crop yields. Supplementary nitrogen treatment to boost crop profits is becoming a more popular practice each year. Agricultural colleges and state experimental stations have proven the benefits of nitrogen . . . and thousands of farmers have seen the results in increased yields right on their own farms.

STRAIGHT or MIXED

Whether it is used for straight application or in mixes such as 10-10-10, USS Ammonium Sulphate is one of the best-known practical sources of nitrogen. It's an ammonia-type nitrogen carrier that requires no special equipment for mixing or direct application . . . these advantages are important to you and to farmers.

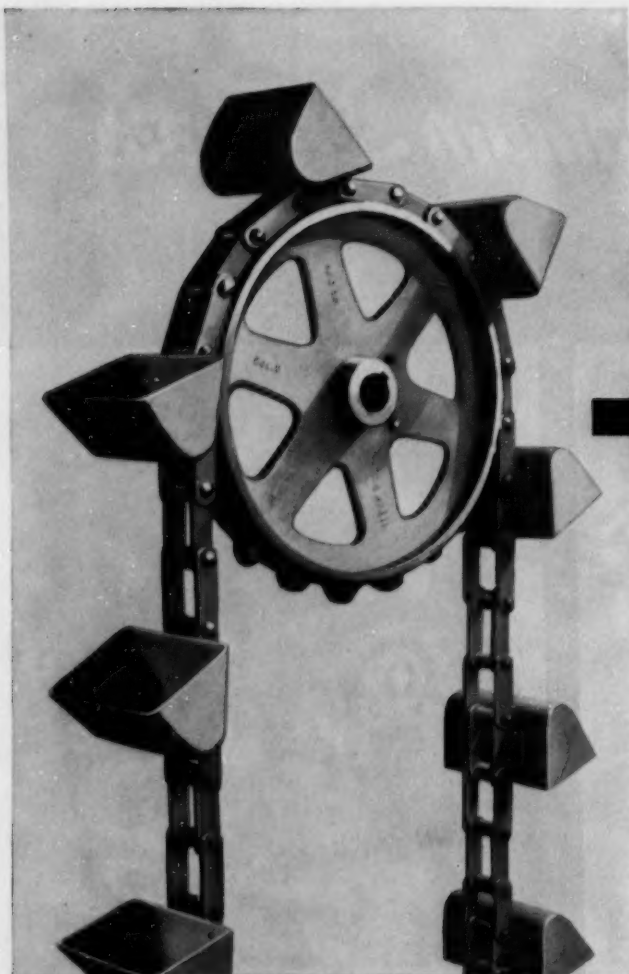
Sales Backing...All the Way

USS Ammonium Sulphate is advertised widely and regularly. These advertisements reach over two-and-a-half million farmers in national and state farm magazines. Nearly seven hundred radio broadcasts in major farming areas are encouraging the use of ammonium sulphate for higher crop yields. FREE folders, explaining the advantages of USS Ammonium Sulphate for use on crops from apples through wheat, are offered to farmers in magazine ads and through fertilizer dealers. All of these sales-backers add up to greater sales for you. Take advantage . . . stock—and use—USS Ammonium Sulphate.



**USS
AMMONIUM
SULPHATE**

UNITED STATES STEEL



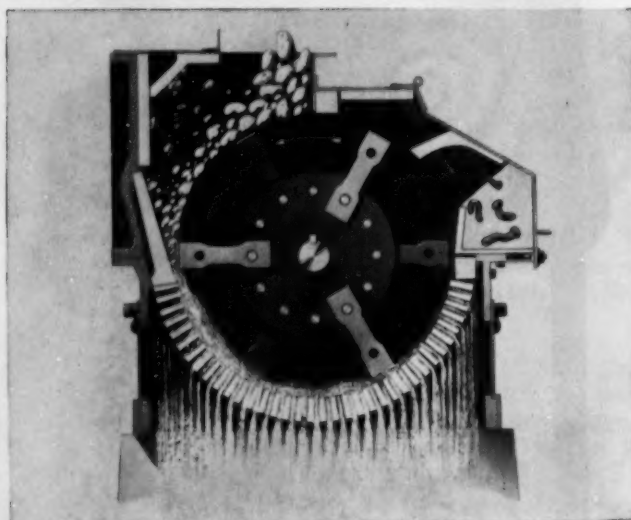
**Handle it
mechanically with
JEFFREY machinery
and save**

JEFFREY CHAIN, SPROCKETS AND BUCKETS

JEFFREY Combination Chain is recommended for drives of moderate speed and for conveying gritty materials. Besides having excellent wearing qualities, it is able to withstand shocks, making it the logical choice for this severe service.

Chainsaver Sprockets, a Jeffrey Development, add to the life of chains in elevating and conveying service. The chain rides on the flanges as well as seating in the usual position, thus distributing the wear.

Jeffrey malleable iron buckets are smooth, seamless and strong, affording comparatively clean delivery of the material. They are highly resistant to the corroding effect of acids, greatly lengthening their life.



Type A Jeffrey Pulverizer

JEFFREY PULVERIZERS

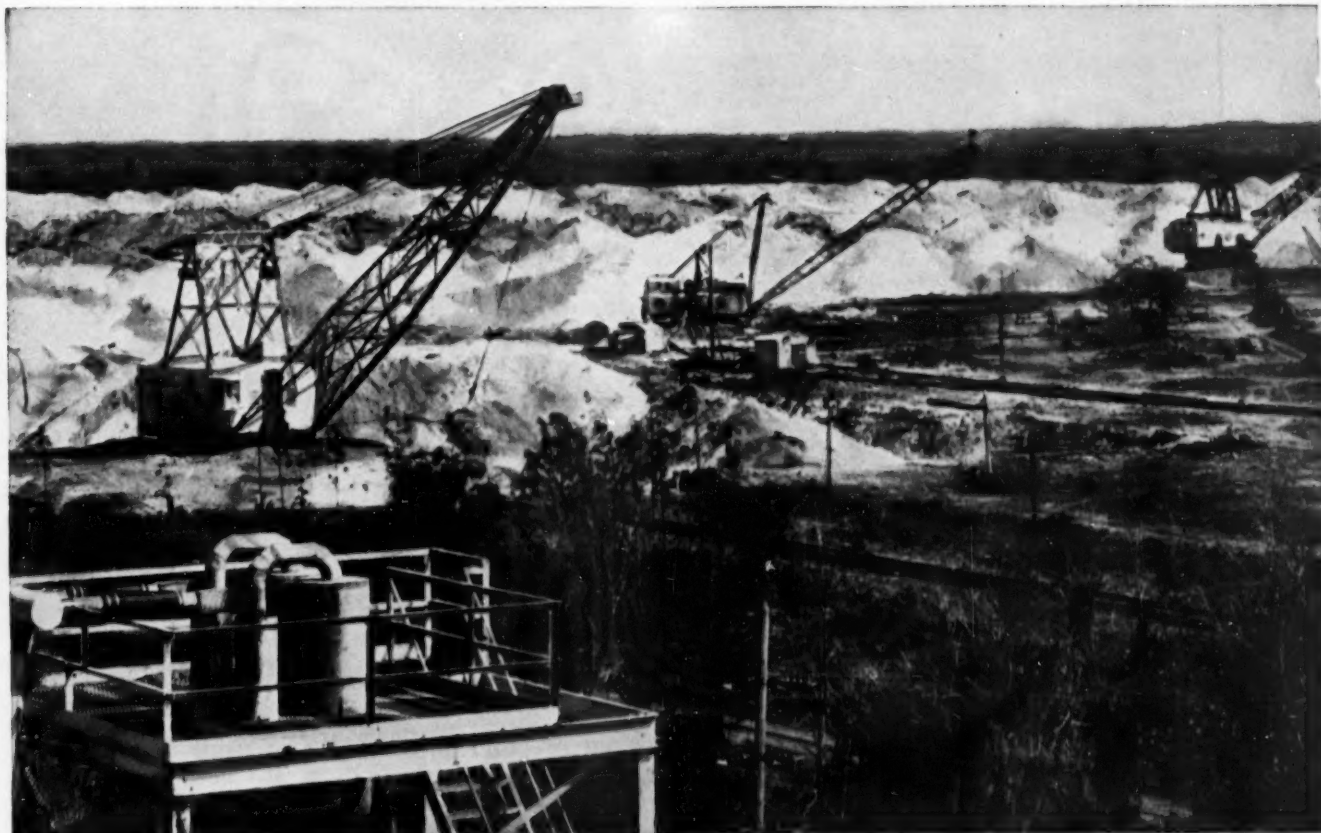
These pulverizers are well suited to reducing the various classes of materials met with in the Fertilizer, Rendering and similar industries. They strike the material while it is in suspension and the degree of fineness is determined by the intensity of the hammer blows and the size of the opening between the screen bars. A large variety of meshes can be obtained simply by varying these two factors.

For help on materials handling problems, write to The Jeffrey Manufacturing Company, Columbus 16, Ohio.



JEFFREY

CONVEYING • PROCESSING • MINING EQUIPMENT • TRANSMISSION MACHINERY • CONTRACT MANUFACTURING



Three of the A.A.C. Co's electrically-operated draglines at work at our phosphate mines in Central Florida. Bucket capacities range from 9½ to 17 cubic yards. The 17-yard draglines with their 175-foot booms each weigh more than a million and a half pounds and can move 35,000 tons of material in 24 hours. From these rock deposits flow a continuous stream of high quality phosphate rock, assuring a dependable source of supply of AA QUALITY phosphorus products, see list below.

AA Quality...

for over 85 years a symbol of quality and reliability

principal AA QUALITY products

All grades of Florida Pebble Phosphate Rock

AA QUALITY Ground Phosphate Rock

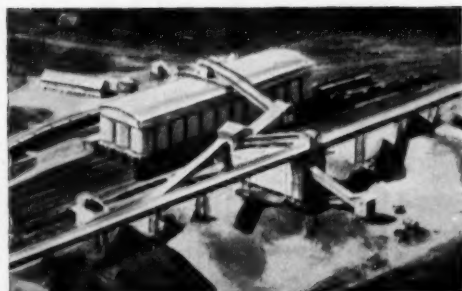
All grades of Complete Fertilizers Superphosphate

Gelatin Bone Products Salt Cake Ammonium Carbonate

Sulphuric Acid Fluosilicates Insecticides and Fungicides

Phosphoric Acid and Phosphates

Phosphorus and Compounds of Phosphorus



From the air—wet rock storage and drying plant, with dry rock storage silos in background. These silos, 29 in number, have a total capacity of 40,000 tons of dried rock. Under the silos are four runways where 40 railroad cars can be loaded at a time.

THE AMERICAN AGRICULTURAL CHEMICAL COMPANY

GENERAL OFFICE: 50 CHURCH STREET, NEW YORK 7, N. Y.

30 FACTORIES AND SALES OFFICES, SERVING U.S., CANADA AND CUBA—ASSURE DEPENDABLE SERVICE



Conveyor belt and
storage bins at
loading decks

Crude Sulphur

for Industrial Use

*from
the
properties
of*

Texas Gulf Sulphur Co.

75 East 45th Street • New York 17, N. Y.

Producing Units

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HYNITE...

NATURAL ORGANIC NITROGEN

The "Magic Touch" In Premium Brands

Fertilizers mixed with Natural Organic Nitrogen give the final touch of perfection to crop growth. Organic nitrogen is considered an essential ingredient by many manufacturers for their premium brands. For many years, Hynite Tankage has been a reliable source of Natural Organic Nitrogen for leading producers—used in hundreds of thousands of tons each year.

Hynite is made from high grade animal matter, carefully processed and sterilized for quality and uniformity. Since it is entirely organic, Hynite provides slowly available nitrogen for uniform feeding of the crop. It also supplies valuable trace elements necessary for healthy crop growth.

Hynite Tankage has an unusually favorable analysis as to high nitrogen content, high availability and low water solubility. Send your order or write for prices and literature.

UNITED FERTILIZER CO.

CARROLLVILLE, WISCONSIN



Hynite
TRADE TANKAGE MARK
REGISTERED
AN ANIMAL AMMONIATE

A Non-Leaching
NATURAL ORGANIC

Highest availability • Carries valuable minor elements

POTASH

The Quality Element

Muriate: 58-60% K_2O

Sulphate: 90-95% K_2SO_4

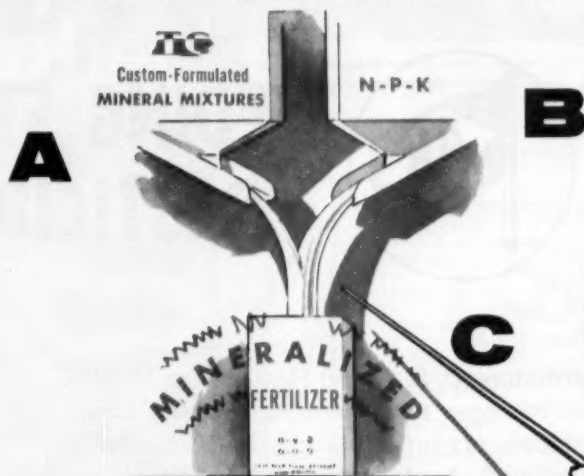
*West German
Origin*

POTASH IMPORT & CHEMICAL CORPORATION

285 MADISON AVENUE, NEW YORK 17, N. Y.

MINERALIZED FERTILIZER

AS SIMPLE TO MAKE AS



With Tennessee's
Custom Formulated
Mineral Mixtures

We custom mix any combination of mineral mixtures to your own specifications. There's only one ingredient to add to your regular fertilizer for a completely balanced plant food. No additional labor or mixing facilities are required since Tennessee's custom-formulated

mineral mixtures come to your plant in bulk or bag carefully mixed in controlled amounts of soluble, readily available forms of Copper, Zinc, Manganese, Iron, Boron, and Magnesium. Cut down on raw material cost, number of items purchased and handling time.

Samples, specifications
and detailed information
on request.

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MATERIALS**



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PESTICIDES**

Exclusive Distributors, U. S. A. and Hawaii, for: HORSE
& LION Brand Nitrogen Fertilizers, Agricultural Chem-
icals and Pesticides, manufactured by Badische Anilin
& Soda Fabrik, A. G., Ludwigshafen, West Germany.

Calcium Nitrate	15½ % Nitrogen
Calcium Ammonium Nitrate	20½ % Nitrogen
Ammonium Sulphate Nitrate	26% Nitrogen
Urea, Pelleted	44% Nitrogen
Urea, Pelleted	46% Nitrogen

LOOK FOR THIS TRADE MARK

**It is Your Guarantee
of Quality and Service**



Your best assurance for a *continuous* supply is a completely integrated supplier!

Kraft Bag Corporation comes closest to being the most completely integrated manufacturer of multiwall shipping sacks in the industry!

Check this chart and see for yourself why Kraft Bag Corporation should be your supplier!

Tell us when we may call to discuss your requirements.



3 Generations
of Bag Making
Experience



FEATURES	KRAFT BAG CORPORATION	OTHER SOURCES ?
Forest Lands	✓	
Pulp Mill	✓	
Bleach Plant	✓	
Paper Mill	✓	
Multiple Bag Plants	✓	
Natural Kraft	✓	
Colored Kraft	✓	
Bleached Kraft	✓	
Creped Kraft	✓	
Wax Laminated Kraft	✓	
Asphalt Laminated Kraft	✓	
Wet-Strength Kraft	✓	
Water Repellent Kraft	✓	
Stak-LOK Super Rough Kraft	✓	
Valve Bags — sewn or pasted	✓	
Open Mouth Bags — sewn or pasted	✓	
Flat Sewn Valve Bags	✓	
Flat Sewn Open Mouth Bags	✓	
KRAFT-lok Valve Closure	✓	
Creped Tape	✓	
Gummed Tape	✓	
Filter Cord	✓	
Sewing Thread — (the only material we do not produce ourselves)		
1-2-3-4 Color Printing	✓	
Art Department	✓	
Bag Development and Research	✓	

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Gilman Paper Company subsidiary

Exclusive Sales Agents for:
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Plants at St. Marys, Georgia and Gilman, Vermont



MURIATE OF POTASH

THIS symbol stands for high-grade coarse and uniform Muriate of Potash (60% K_2O minimum). Southwest Potash Corporation provides a dependable supply of HIGH-K* Muriate for the plant food industry.

*Trade Mark

Southwest Potash Corporation

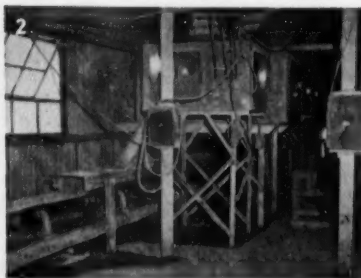
27 BROADWAY • NEW YORK 5, N. Y.

How Spencer Helped Ark-Mo Cut 12-12-12 Formula Costs 16%

New granulation process developed jointly by Spencer and Ark-Mo lowers costs on 12-12-12 and other high nitrogen grades:



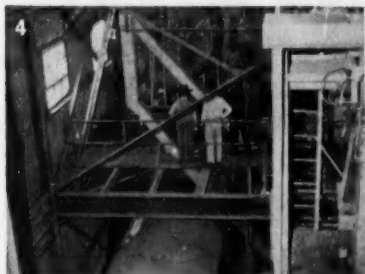
The big secret is accurate control throughout the process. At this panel the flow of various ingredients is recorded together with temperatures at various locations in the system.



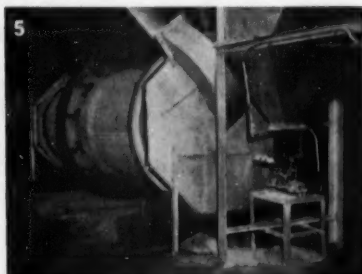
Raw materials are weighed separately by these gravametric feeders. Conveyor belt and elevator carries materials to screens and crushers where over-sized are ground to pass 10-mesh.



The liquids are added in this ammoniator-granulator, only equipment of special design in the new Ark-Mo plant. All nitrogen is derived from SPENSOL solutions, in nearly all grades.



From the ammoniator the material flows to the dryer (foreground). Then it goes to the cooler and finished product screens. Fines are collected and weighed back into system.



In this machine the high nitrogen grades are coated with diatomaceous earth on way to storage. Low nitrogen grades go direct from cooler to storage by conveyor belt.

Another example of how Spencer looks after its customers' profits:

With today's competition it's even more vital to keep your formula costs low. To develop cost-cutting information for our SPENSOL customers, we joined with the Ark-Mo Plant Food Company, Walnut Ridge, Ark., to design a new plant where latest granulation information could be put into practice on a commercial scale. The result was a substantial decrease in the formula costs of high nitrogen fertilizers. For more information, write: Technical Service Staff, Spencer Chemical Co., 530 Dwight Bldg., Kansas City 5, Missouri.



SPENCER CHEMICAL COMPANY, Dwight Bldg., Kansas City 5, Mo. District Sales Offices: Atlanta, Ga.; Chicago, Ill.; Memphis, Tenn.; Works: Pittsburg, Kans.; Henderson, Ky.; Chicago, Ill.; Vicksburg, Miss.; Orange, Texas.

America's Growing Name in Chemicals

EFFICIENCY

↓ in producing PHOSPHATE PRODUCTS

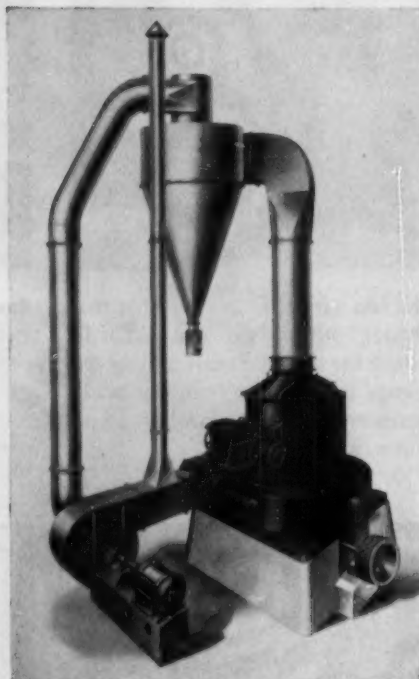
RAYMOND

Over a half-century of leadership shows the consistent fine performance of the Raymond Roller Mill in handling all types of deposits and producing uniformly pulverized phosphate rock for acidulation and direct application.

Important advantages of this equipment include:

- Simplicity of installation to meet existing plant layout
- Ease of fineness adjustment and consistent finished products
- Automatic control and dustfree operation
- Low maintenance and power costs
- Record economies in production, year after year

Raymond Roller Mills are available in a wide range of capacities up to 30 tons or more per hour.



For complete details, write for Raymond Catalog No. 79



COMBUSTION ENGINEERING, INC.

Raymond Division

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Chicago 22, Illinois

Combustion Engineering-Superheater, Ltd., Montreal, Canada

Sales Offices in
Principal Cities



'WAY OUT AHEAD!

WEATHERLY GRANULATION

20 TO 60 TONS PER HOUR

•
CONTROLLED GRANULATION

•
GUARANTEED HIGH RATE
OF PRODUCTION

•
LOWEST RAW MATERIAL COST

•
HIGHEST QUALITY, HEAVY
DUTY EQUIPMENT

•
CONTINUING SERVICE

● Major fertilizer companies have looked the field over with care—and have chosen the Weatherly Controlled Granulation Process. Our installations, a dozen initiated since June of last year, have proven the soundness of the Weatherly “package” — and borne out all we have said, in person, in writing, and in print:

- They produce a closely sized product—all through 6 mesh and retained on 16 mesh screen.
- They stay on the designed capacity.
- They turn out a high quality, high volume, guaranteed production, using the lowest cost raw materials.
- They are built with the highest quality, heavy duty equipment.

The D. M. WEATHERLY COMPANY

Industrial Engineers and Builders

830 Ponce de Leon Ave., N.E., Atlanta, Georgia PHONE: ELgin 8384

F.S. ROYSTER GUANO CO.



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AND DEALERS IN
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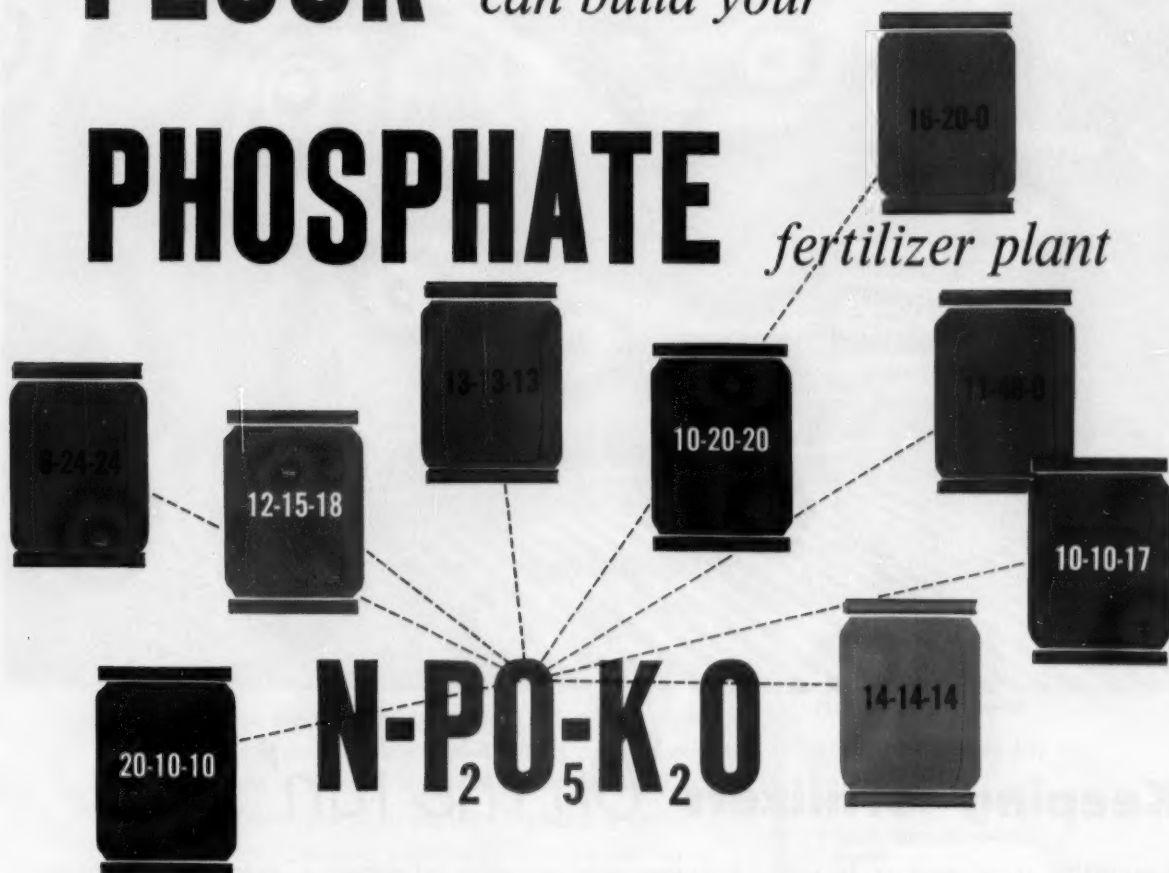
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FLUOR

can build your

PHOSPHATE

fertilizer plant



Fluor enters the phosphate fertilizer industry through an exclusive agreement with St. Gobain of France. At a time when few men realized the vast significance of complete fertilization, St. Gobain was developing commercial processes for the manufacture of phosphate fertilizers.

In cooperation with St. Gobain, Fluor designs, engineers and constructs entire plants of any tonnage for the low-cost production of ammonium phosphates, nitric phosphates, limed ammonium nitrate, triple superphosphate, and other complete fertilizers containing nitrogen, phosphorus and potassium. The St. Gobain-U.C.B.* phosphoric acid process presents the latest advancements in phosphate rock acidulation techniques resulting in high yields and low costs.

Products are of superior quality. In particular, granulated ammonium and nitric-phosphate types are homogeneous, hard, and free-flowing materials. Varying degrees of P_2O_5

water solubility may be produced at will for the nitric-phosphate types.

A variety of fertilizer products can be made from a Fluor-designed plant. As the fertilizer market shifts its demand, the same equipment can not only produce several different formulas of the same type, but with only minor changes can be converted to produce new and different types of fertilizers. Investing in a plant that can do the work of two or three is good foresight.

In addition to the many refining and processing facilities for the petroleum, natural gas and chemical industries, Fluor has four anhydrous ammonia plants in various stages of design and construction with a total daily output of 700 tons. Fluor offers better processes and a capable engineering/construction organization to the plant food producers of the United States and Canada. We welcome your inquiry.

BE SURE WITH

FLUOR



THE FLUOR CORPORATION, LTD.
LOS ANGELES 22, CALIFORNIA, U.S.A.

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ENGINEERS
CONSTRUCTORS
MANUFACTURERS

*Union Chimique Belge.



How Celite Mineral Fillers make a product free-flowing...



Keeping fertilizers "On the run"

REALIZING their product is one that cannot "cake-up" and still survive in a competitive market, leading producers of fertilizer use one of the Celite Mineral Fillers as a standard "anti-caking" ingredient.

The ability of Celite Fillers to keep a product free-flowing results from their

high absorption properties and unique diatom structure—properties which make them unusually effective safeguards against caking in deliquescent materials. They are two of the unusual physical characteristics that adapt these diatomaceous silica powders to numerous industrial uses.

THESE CELITE PROPERTIES BENEFIT MANY TYPES OF PRODUCTS

Because of their inertness and great bulk per unit of weight, Celite Mineral Fillers make ideal bulking agents for powders and pastes. Their tiny multi-shaped particles interlace to stiffen and strengthen admixtures. The microscopically small facets of these particles diffuse light so effectively that they can be utilized to impart any desired degree of flatness to a surface film. Their light, porous nature improves suspension, helps prevent

segregation. And their porous, thin-walled cellular structure imparts a delicate non-scratching abrasive action.

You may find Celite the "extra something" needed to lift your product above competition. Why not discuss its application to your problem with a Celite engineer? Or write for further information and samples to Johns-Manville, Box 60, New York 16, N. Y. In Canada: 199 Bay St., Toronto, Ont.

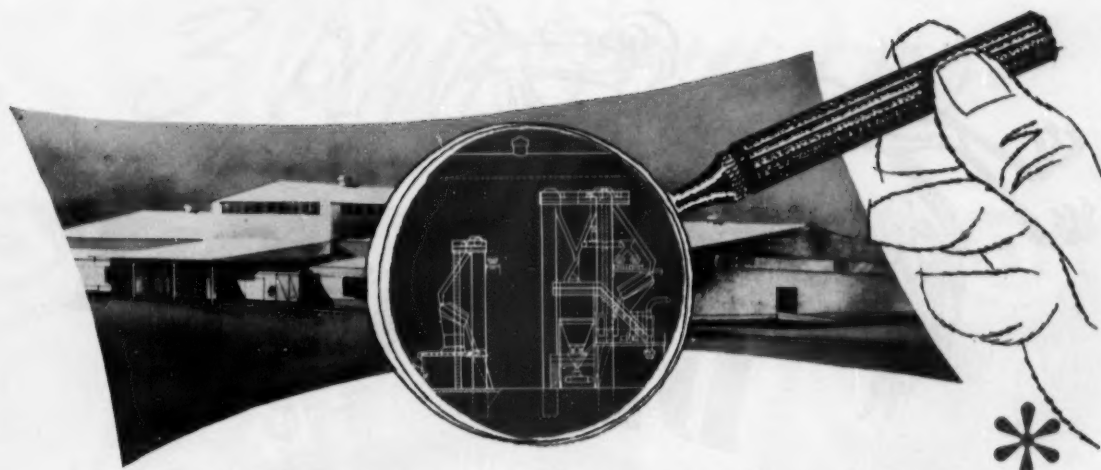
CHECK LIST OF PRODUCT BENEFITS OBTAINABLE AT LITTLE COST WITH CELITE MINERAL FILLERS

- Added Bulk
- Better Suspension
- Faster Cleaning Action
- Greater Absorption
- Improved Color
- Better Dielectric Properties
- More Durable Finish
- Increased Viscosity
- Elimination of Caking
- Higher Melting Point
- Better Dry Mixing
- Improved Dispersion



Johns-Manville CELITE®

MINERAL FILLERS



Take advantage of Specialized Design for your **FERTILIZER PLANT**

Many years of experience in the fertilizer industry have given the Harte Company valuable knowledge about the development and application of the fertilizer processes. Extensive study and research have made Harte engineers cognizant of the over-all picture of fertilizer plant design, realizing that certain fundamentals must be followed while specializing each plant. Chemical processes, machinery, mechanical operations, production facilities are carefully studied and adapted to fit the needs of each individual fertilizer plant.

The diversified experience and 'know-how' of Harte engineers are available to aid you in your fertilizer plant design. If you plan to build a fertilizer mixing plant, or an associated plant, the Harte organization can handle your complete job or any part from original design to an operating plant . . . anywhere, assuring economy and speed.

*

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Fur-Ag has long been the first choice of leading fertilizer manufacturers—has thoroughly proved its commercial value. Fur-Ag is the inexpensive organic conditioner produced in volume by The Quaker Oats Company and shipped to you on *schedule*.



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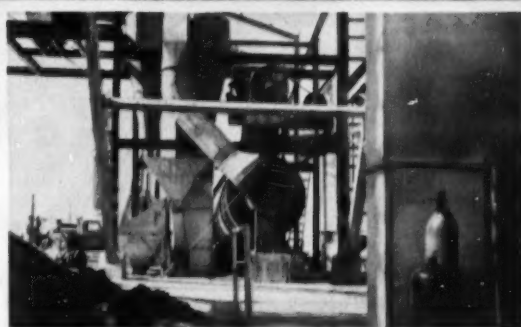
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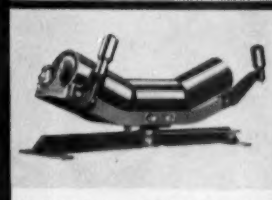
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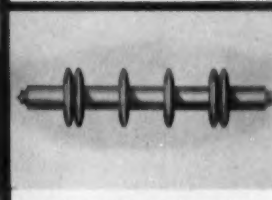
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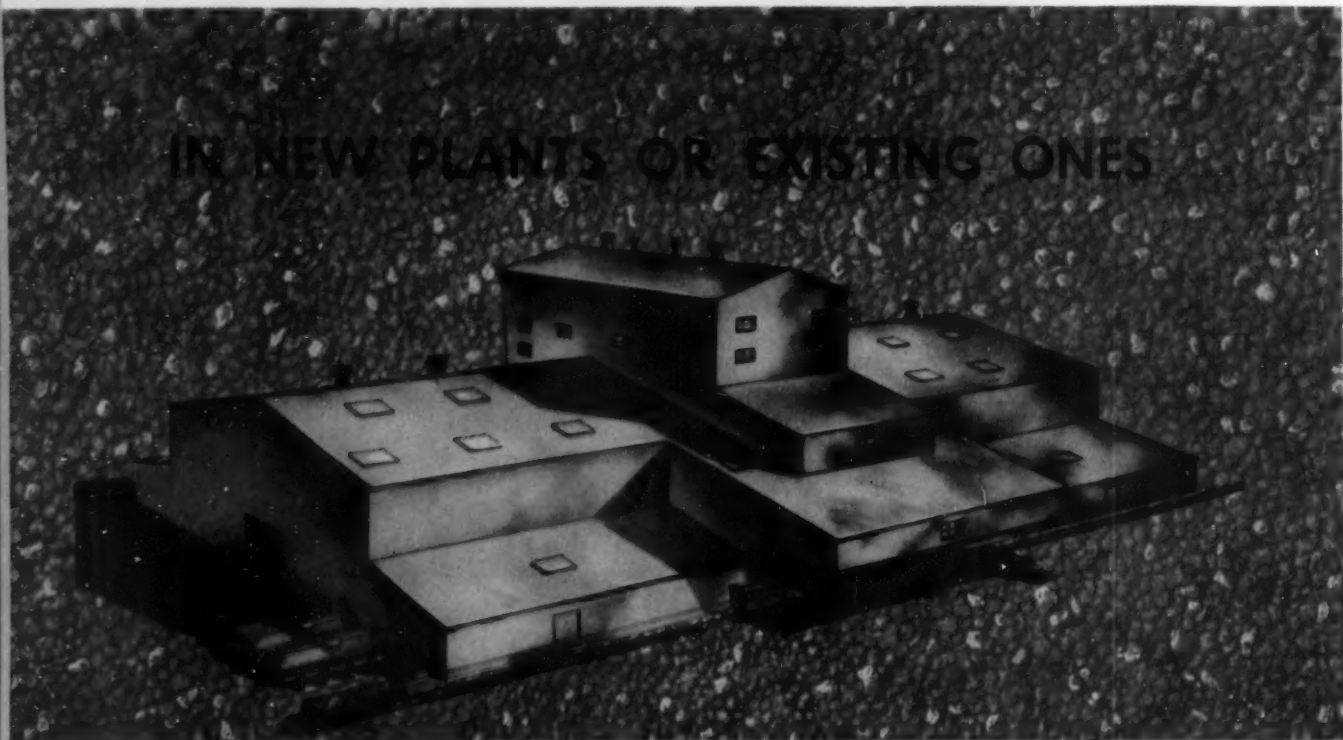
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Domestic Fertilizer Consumption

For the year ended June 30, 1954, the consumption of fertilizers in the United States and territories amounted to 22,773,499 tons or 2.73 percent less than the consumption in 1952-53. This quantity comprised 22,157,986 tons of products containing one or more of the primary nutrients (N, available P_2O_5 , K_2O) and 615,513 tons of the secondary and trace element materials which did not contain primary nutrients. The consumption of these fertilizers was, respectively, 377,135 tons (1.67 percent) and 261,974 tons (29.86 percent) less than that in 1952-53.

Although the tonnage of fertilizers used in 1953-54 was lower than in 1952-53, a new record in total consumption of primary nutrients was set for the fifteenth consecutive year. Thus the consumption of these nutrients amounted to 5,895,558 tons, an increase of 4.42 percent (249,502 tons) over that in the preceding year. The consumption of nitrogen increased 12.85 percent (210,360 tons) to 1,847,416 tons and that of K_2O 3.90 percent (67,792 tons) to 1,806,042 tons, whereas the consumption of available P_2O_5 decreased 1.26 percent (28,650 tons) to 2,242,100 tons. The content of total P_2O_5 in all fertilizers decreased 4.28 percent (118,317 tons) to 2,646,971 tons.

The average primary nutrient content of fertilizers bearing primary nutrients was 26.61 percent in 1953-54 as compared with 25.05 percent for the preceding year.

The data presented herein were compiled from manufacturers' reports of shipments to agents, dealers, distributors, and farmers in the Territories (except Alaska), the District of Columbia, and the States except California, Florida, Massachusetts, Missouri, North Carolina, South Carolina, and Texas. For the latter seven States the data were compiled chiefly from the reports of the respective fertilizer control officials. No data were available for Alaska. Supplementary information was furnished by the control offices and other State agencies, as well as by fertilizer brokers, and special inquiries were made of all known distributors and custom applicators of

by
WALTER SCHOLL, HILDA M. WALLACE & ESTHER I. FOX

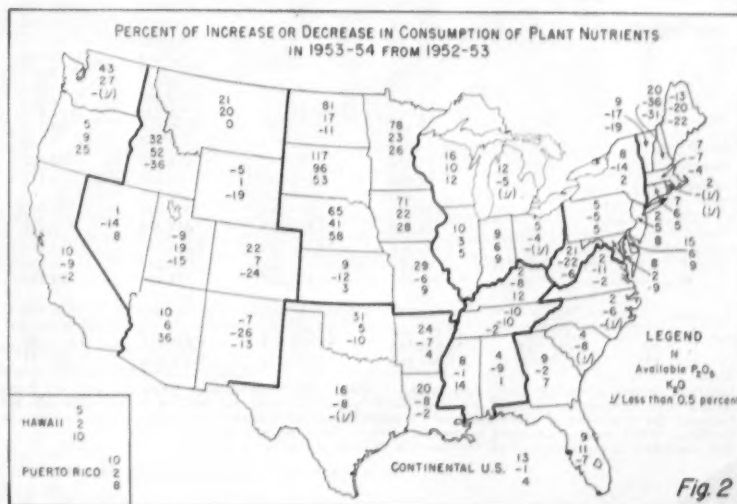
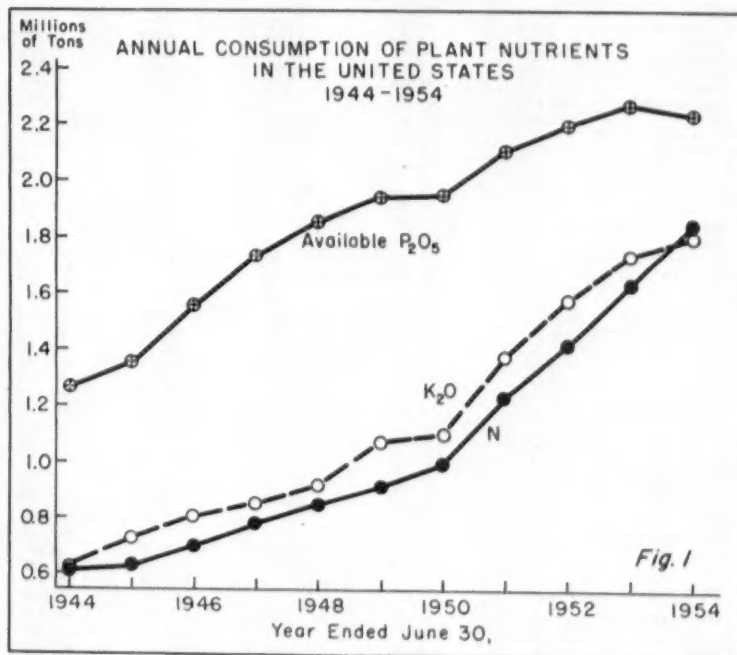
FERTILIZER AND AGRICULTURAL LIME SECTION
SOIL AND WATER CONSERVATION RESEARCH BRANCH
AGRICULTURAL RESEARCH SERVICE
U. S. DEPARTMENT OF AGRICULTURE
BELTSVILLE, MARYLAND

anhydrous ammonia.

The quantities are reported as 2,000-pound tons. Although the data refer to shipments, the terms "consumption," "sales," and "shipments" are used synonymously. The actual consumption differs slightly, no doubt, from either the shipments or sales.

ALL FERTILIZERS

The consumption of the two classes of fertilizers, mixtures and materials, is summarized by States and regions in Table 1. The tonnage of all fertilizers consumed in each of 16 States, the District of Columbia, Hawaii, and Puerto Rico was higher than in 1952-53.



Based on the tonnages for each six month period of 1952-53, most of the decrease in total consumption of all fertilizers in 1953-54 occurred in the July-December period. Consumption for this period in 1953-54 was 781,930 tons (11.57 percent) below that for the corresponding period of 1952-53, while for the January-June period consumption was 142,821 tons (0.86 percent) above the quantity for the same period of 1952-53. During the fall period, there was a decrease of 317,338 tons of mixtures and 464,592 tons of materials, while in the spring period the consumption was higher by 136,190 tons

of mixtures and 6,631 tons of materials.

Regional distribution of the consumption of all fertilizers in 1952-53 and 1953-54, as percentages of the country totals, is shown in Table 1a.

Table 1a.—Regional Percentage Distribution of Consumption of All Fertilizers

Region	1952-53	1953-54
New England	2.01	1.83
Middle Atlantic	9.05	9.08
South Atlantic	26.79	26.97
East North Central	21.79	21.18
West North Central	8.95	9.77
East South Central	13.62	13.28
West South Central	5.99	6.12
Mountain	1.55	1.73
Pacific	8.64	8.23
Territories	1.61	1.81
United States	100.00	100.00

In Table 1, the percentage change in consumption of fertilizers in 1953-54 as compared with 1952-53 is based on the tonnage of primary nutrient fertilizers only, in order that a direct comparison may be made with the percentage change in consumption of the primary nutrients themselves.

MIXTURES

Mixed fertilizers consumed in the United States and Territories amounted to 15,541,076 tons, as compared with 15,722,224 tons in 1952-53. The quantity of mixtures consumed in 1953-54 was 68.24 percent of the total fertilizer tonnage, as compared with an average of 67.46 percent for the preceding five-year period. In

Table 1.—Consumption of Fertilizers, Year Ended June 30, 1954¹

State & Region	Mixtures			Materials ²			All Fertilizers 1953-54	Relative Consumption 1952-53 = 100	
	July 1—Dec. 31, 1953	Jan 1—June 30, 1954	Total	July 1—Dec. 31, 1953	Jan. 1—June 30, 1954	Total		Fertilizers ³	Total N, Avail. P ₂ O ₅ & K ₂ O
	Tons	Tons		Tons	Tons				
Maine	17,703	147,047	164,750	2,516	4,516	7,032	171,782	81	81
New Hampshire	1,444	10,381	11,825	861	3,126	3,987	15,812	74	74
Vermont	3,130	24,434	27,564	5,899	4,978	10,877	38,441	77	85
Massachusetts	10,120	58,996	69,116	4,330	11,572	15,902	85,018	100	98
Rhode Island	1,839	11,616	13,455	633	1,378	2,011	15,466	100	100
Connecticut	6,395	38,808	45,203	3,525	21,508	25,033	90,236	104	106
New England	40,631	311,282	351,913	17,764	47,078	64,842	416,755	89	88
New York	94,453	418,689	513,142	39,738	56,565	96,303	609,445	92	95
New Jersey	50,635	215,403	266,038	8,351	16,619	24,970	291,008	105	105
Pennsylvania	156,080	452,097	608,177	24,890	47,880	72,770	680,947	97	100
Delaware	13,409	75,364	88,773	931	5,177	6,108	94,881	105	109
District of Columbia	565	1,342	1,907	458	333	791	2,698	104	105
Maryland	73,604	218,421	292,025	5,800	14,718	20,518	312,543	103	106
West Virginia	13,191	54,660	67,851	3,722	5,610	9,332	77,183	88	89
Middle Atlantic	401,937	1,435,976	1,837,913	83,890	146,902	230,792	2,068,705	98	100
Virginia	147,453	537,648	685,101	22,296	91,666	113,962	799,063	94	95
North Carolina	218,046	1,272,600	1,490,646	46,390	312,163	358,553	1,849,199	98	98
South Carolina	100,945	571,078	672,023	41,709	227,389	269,098	941,121	96	98
Georgia	158,151	944,555	1,102,706	50,260	216,068	266,328	1,369,034	98	104
Florida	415,334	656,196	1,071,530	46,113	67,038	113,151	1,184,681	103	104
South Atlantic	1,039,929	3,982,077	5,022,006	206,768	914,324	1,121,092	6,143,098	98	100
Ohio	308,914	709,228	1,018,142	24,150	51,876	76,026	1,094,168	93	99
Indiana	235,604	788,496	1,024,100	49,755	106,873	156,628	1,180,728	98	108
Illinois	169,980	461,540	631,520	411,552	463,075	874,627	1,506,147	91	105
Michigan	156,891	388,340	545,231	17,812	37,349	55,161	600,392	93	99
Wisconsin	70,210	331,931	402,141	10,498	28,564	39,062	441,203	105	112
East North Central	941,599	2,679,535	3,621,134	513,767	697,737	1,201,504	4,822,638	95	104
Minnesota	48,295	203,259	251,544	20,145	51,086	71,231	322,775	121	132
Iowa	86,053	334,811	420,864	80,873	150,421	231,294	652,158	118	136
Missouri	141,683	327,052	468,735	114,778	173,107	287,885	756,620	91	108
North Dakota	6,419	16,639	23,058	9,952	14,667	24,619	47,677	118	121
South Dakota	2,299	11,100	13,399	4,676	11,932	16,608	30,007	180	202
Nebraska	12,790	53,156	65,946	41,897	91,273	133,170	199,116	136	157
Kansas	53,723	45,847	99,570	63,640	52,679	116,319	215,889	90	95
West North Central	351,252	991,864	1,343,116	335,961	545,165	881,126	2,224,242	106	123
Kentucky	33,979	398,794	432,773	35,289	93,521	128,810	581,583	95	100
Tennessee	70,133	324,999	395,132	40,502	88,460	128,962	524,094	90	92
Alabama	91,584	745,949	837,533	113,722	232,239	345,961	1,183,494	94	98
Mississippi	19,889	334,519	354,408	140,371	239,949	380,320	734,728	100	107
East South Central	235,585	1,804,261	2,039,846	329,884	654,169	984,053	3,023,899	95	100
Arkansas	18,966	174,831	193,797	35,592	141,288	176,880	370,677	101	109
Louisiana	26,581	144,781	171,362	44,324	100,480	144,804	318,166	100	106
Oklahoma	24,323	40,191	64,514	50,148	30,328	80,476	144,990	99	109
Texas	60,663	220,724	281,387	125,808	153,800	279,608	560,995	99	102
West South Central	132,533	580,527	713,060	255,872	425,896	681,768	1,394,828	100	106
Montana	1,103	3,131	4,234	11,894	12,974	24,868	29,102	112	120
Idaho	72	6,714	6,786	30,756	52,452	83,208	89,994	122	141
Wyoming	55	2,324	2,379	2,965	5,888	8,853	11,232	88	99
Colorado	3,224	11,466	14,690	10,146	22,938	33,084	47,774	97	110
New Mexico	172	1,975	2,147	5,570	14,645	20,215	22,362	81	82
Arizona	5,519	15,943	21,462	38,843	94,896	133,739	155,201	112	109
Utah	270	3,351	3,621	9,427	15,369	24,796	28,417	89	102
Nevada	201	672	873	2,737	5,545	8,282	9,155	94	93
Mountain	10,616	45,576	56,192	112,338	224,707	337,045	393,237	106	112
Washington	5,777	23,853	29,630	58,469	113,172	171,641	201,271	131	134
Oregon	4,519	17,460	21,979	45,347	80,074	125,421	147,400	99	107
California	83,168	138,096	221,264	581,660	723,042	1,304,702	1,525,966	108	103
Pacific	93,464	179,409	272,873	685,476	916,288	1,601,764	1,874,637	109	108
Continental U. S.	3,247,546	12,010,507	15,258,053	2,541,720	4,562,246	7,103,966	22,362,039	98	104
Hawaii	30,237	28,927	59,164	36,245	44,670	80,914	140,049	108	106
Puerto Rico	92,239	131,620	223,859	25,434	22,119	47,553	271,412	110	108
Alaska ⁴									
Territories	122,476	160,547	283,023	61,679	66,758	128,437	411,460	109	107
Total: 1953-54	3,370,022	12,171,054	15,541,076	2,603,399	4,629,024	7,232,423	22,773,499	98	104
1952-53	3,687,360	12,034,864	15,722,224	3,067,991	4,622,393	7,690,384	23,412,608	100	100
1951-52	3,533,404	11,532,945	15,066,349	2,856,958	4,489,111	7,346,069	22,432,418	96	92

¹ Includes: Ground phosphate rock, basic slag, secondary and trace element materials, such as, borax, sulfur, manganese sulfate, etc., used as separate materials, also fertilizers distributed by government agencies. Does not include liming materials, but includes gypsum.

² Excludes the quantities of materials used for manufacture of commercial mixtures.

³ Fertilizers which were guaranteed to contain primary plant nutrients (N, P₂O₅, K₂O).

⁴ Not available: Consumption of all fertilizers in 1952-53 amounted to 653 tons.

1953-54, 1,319 grades were reported by their guaranteed analyses. It is estimated that additional grades approximating 500 in number were reported under unspecified designations.

Consumption of individual grades of mixtures in total quantities of 2,500 tons or more in the continental United States is shown in Table 2. In 1953-54, there were 176 of these grades totaling 14,853,606 tons and accounting for 97.35 percent of the total quantity of mixtures consumed. Other reported grades numbered 1,044 and totaled 280,907 tons, and approximately 500 grades reported under unspecified designations totaled 123,540 tons.

Consumption of mixed fertilizers in Hawaii and Puerto Rico totaled 283,023 tons in 141 grades (all specified). While most of the grades in Puerto Rico are similar to those used on the Continent, many of those in Hawaii are designated in fractional numbers.

The tonnages of the ten grades most favored in the continental United States are shown in Table 2a. See page 39.

The total tonnage of these goods accounted for 50 percent or more of the total tonnage of mixtures consumed in the continental United States in both 1952-53 and 1953-54. Grades 3-12-12, 5-10-10, and 5-10-5 were the only ones of this group that retained the same relative position in both years. Grade 3-9-6 ranked fourth in 1952-53 but dropped to sixth place in 1953-54, being exceeded in tonnage by grades 10-10-10 and 4-16-16.

The tonnages of the 15 principal grades consumed in each of the continental regions and Puerto Rico in 1953-54 are shown in Table 3, together with the tonnages of these grades for each State in the region. The total tonnage of these 15 grades represents 55 percent or more of the consumption of mixtures in each of the regions.

Among the individual States, the total number of specified grades ranged from 16 for Nevada to 782 for Florida. For California, the number originally reported was 599, but subsequent information from the State fertilizer control office indicates over 800; some 200 grades were originally included in the unspecified group.

The consumption of mixtures by classes (N-P-K, N-P, P-K, N-K) for each region and the United States is shown in Table 5. Except for the Mountain region, N-P-K mixtures

Table 2.—Consumption of Principal Mixed Fertilizers in the Continental United States, By Grades, Years Ended June 30, 1953 and 1954

Grade	Consumption		Proportion of total		Grade	Consumption		Proportion of total	
	1952-53	1953-54	1952-53	1953-54		1952-53	1953-54	1952-53	1953-54
	Tons	Tons	Percent	Percent		Tons	Tons	Percent	Percent
0-8-24	4,026	5,468	0.03	0.04	6-8-6	239,370	195,320	1.55	1.28
0-9-27	26,497	15,510	.17	.10	6-8-8	274,168	288,134	1.77	1.89
0-10-10	3,194	4,367	.02	.03	6-8-12	42,704	40,244	.28	.26
0-10-20	62,993	49,130	.41	.32	6-8-16	2,582	2,766	.02	.02
0-10-30	35,324	45,006	.23	.30	6-9-3	6,666	5,534	.04	.04
0-10-45	2,799	3,769	.02	.02	6-9-6	13,839	11,553	.09	.07
0-12-12	123,881	66,343	.80	.43	6-9-9	8,177	8,271	.05	.05
0-12-16	3,260	2,765	.02	.02	6-9-12	70,840	54,609	.46	.36
0-12-20	26,478	20,121	.17	.13	6-9-27	2,308	3,035	.02	.02
0-12-24	2,017	2,974	.01	.02	6-10-4	59,792	57,216	.39	.37
0-12-36	6,076	8,354	.04	.06	6-12-4	3,643	3,383	.02	.02
0-14-5	3,852	4,611	.03	.03	6-12-6	53,609	51,806	.35	.34
0-14-7	76,332	32,590	.49	.21	6-12-12	166,226	185,274	1.08	1.21
0-14-10	25,786	8,200	.17	.05	6-12-18	3,976	4,223	.03	.03
0-14-14	266,386	177,499	1.72	1.16	6-12-20	2,348	4,533	.02	.03
0-15-15	31,858	11,632	.21	.08	6-20-20	30,626	21,335	.20	.14
0-15-30	12,876	17,998	.08	.12	6-24-0	22,506	43,087	.15	.28
0-16-8	9,208	12,881	.06	.08	6-24-12	6,316	13,356	.04	.09
0-20-10	26,770	22,905	.19	.15	7-0-11	0	5,037	.00	.03
0-20-20	305,125	343,162	1.97	2.25	7-5-7	2,578	2,690	.02	.02
0-30-15	3,528	5,525	.02	.04	7-5-9	0	3,418	.00	.02
0-30-30	6,532	11,055	.04	.07	7-7-7	38,202	36,428	.25	.24
2-10-8	7,797	8,044	.05	.05	7-7-10	61	4,199	(2)	.03
2-12-6	156,447	81,034	1.01	.53	7-8-8	1,166	3,183	.01	.02
2-12-12	409,203	404,036	2.65	2.65	7-9-9	3,911	2,546	.03	.02
3-8-5	6,442	4,302	.04	.03	8-0-8	13,061	16,084	.08	.11
3-8-8	16,866	12,743	.11	.08	8-0-12	10,127	6,625	.07	.04
3-9-6	671,216	608,256	4.34	3.99	8-0-24	18,541	20,088	.12	.13
3-9-9	453,699	489,239	2.95	3.21	8-4-4	2,978	2,666	.02	.02
3-9-12	38,079	28,981	.25	.19	8-4-8	11,439	37,279	.07	.24
3-9-15	7,081	9,308	.05	.06	8-6-4	4,138	5,443	.03	.04
3-9-18	154,665	113,702	1.00	.75	8-6-6	4,931	7,339	.03	.02
3-9-27	118,009	123,964	.76	.81	8-6-8	7,722	3,545	.05	.05
3-10-8	5,098	2,693	.03	.02	8-8-4	21,080	20,037	.14	.13
3-10-12	7,787	6,209	.05	.04	8-8-8	342,242	254,471	2.21	1.67
3-12-6	478,876	278,396	3.10	1.82	8-8-8	4,697	5,876	.03	.04
3-12-8	3,262	3,999	.01	.03	8-9-10	13,851	11,742	.09	.08
3-12-12	2,241,137	1,730,944	14.50	11.34	8-12-12	15,747	27,833	.10	.18
3-18-9	114,515	72,765	.74	.48	8-12-16	34,869	17,021	.23	.11
4-6-5	6,126	6,201	.04	.04	8-16-8	7,853	7,062	.05	.05
4-6-6	17,290	15,583	.11	.10	8-16-16	67,434	94,752	.44	.62
4-6-8	51,267	48,399	.33	.32	8-24-8	106,141	101,509	.69	.66
4-7-5	130,603	130,530	.85	.86	8-24-12	769	6,583	(2)	.04
4-8-4	13,736	13,987	.09	.09	8-32-0	53,376	72,178	.35	.47
4-8-6	481,175	320,689	3.11	2.10	9-6-6	5,632	6,921	.04	.05
4-8-8	330,422	393,331	2.14	2.58	9-9-6	2,303	3,803	.01	.02
4-8-10	63,485	87,500	.41	.57	9-18-9	4,056	4,760	.03	.03
4-8-12	78,761	51,841	.51	.34	9-36-0	1,236	2,522	.01	.02
4-9-3	77,400	76,442	.50	.50	10-0-10	34,396	44,797	.22	.29
4-10-6	581,802	498,719	3.76	3.27	10-0-12	1,953	2,539	.01	.02
4-10-7	527,094	552,416	3.41	3.62	10-4-10	3,613	5,687	.02	.04
4-10-8	5,810	6,334	.04	.04	10-5-5	3,151	2,559	.02	.02
4-10-10	9,636	9,513	.06	.06	10-6-4	38,474	35,258	.25	.23
4-12-4	192,110	142,517	1.24	.93	10-10-0	18,387	8,007	.12	.05
4-12-6	7,346	2,883	.05	.02	10-10-5	37,659	30,971	.24	.20
4-12-8	160,948	152,806	1.04	1.00	10-10-10	401,079	701,365	2.60	4.60
4-12-12	204,660	370,014	1.32	2.43	10-12-10	4,418	3,840	.03	.03
4-12-16	3,110	2,651	.02	.02	10-15-15	5,857	2,893	.04	.02
4-12-24	1,735	3,110	.01	.02	10-16-8	10,468	9,948	.07	.07
4-16-0	25,882	11,996	.17	.08	10-20-0	121,300	117,049	.78	.77
4-16-8	71,295	52,456	.46	.34	10-20-10	23,235	48,714	.15	.32
4-16-16	473,321	698,177	3.06	4.58	10-20-20	2,900	9,088	.02	.06
4-24-12	81,371	55,070	.53	.36	10-30-10	6,391	3,624	.04	.02
5-3-6	2,803	3,640	.02	.02	12-0-10	12,584	14,146	.08	.09
5-5-5	1,694	2,564	.01	.02	12-0-12	10,307	5,148	.07	.03
5-5-8	7,661	8,208	.05	.05	12-6-6	4,449	3,583	.03	.02
5-5-10	1,246	2,538	.01	.02	12-8-8	2,820	3,837	.02	.03
5-6-6	1,487	2,702	.01	.02	12-12-6	3,289	3,758	.02	.02
5-6-8	7,782	7,363	.05	.05	12-12-12	73,072	208,922	.47	1.37
5-7-5	25,977	24,068	.17	.16	12-24-0	8,880	11,743	.06	.08
5-7-10	5,141	3,725	.03	.02	12-24-12	36,891	31,354	.24	.21
5-8-7	19,922	16,840	.13	.11	13-12-13	13,786	24,136	.10	.16
5-8-8	4,632	4,630	.03	.03	14-0-14	30,509	38,992	.20	.25
5-10-5	877,240	821,116	5.68	5.38	14-14-0	5,008	8,286	.03	.05
5-10-10	1,115,741	1,287,746	7.22	8.44	14-14-14	0	2,852	.00	.02
5-10-15	33,221	89,404	.22	.59	15-0-12	3,078	4,437	.02	.03
5-10-16	16,318	5,933	.11	.04	15-8-4	14,483	8,451	.09	.06
5-10-20	3,789	7,819	.02	.05	15-15-0	32,404	58,402	.21	.38
5-15-10	22,831	10,040	.15	.07	16-0-6	2,764	2,574	.02	.02
5-15-15	4,084	17,319	.03	.11	16-10-0	0	6,558	.00	.04
5-15-30	4,023	4,747	.03	.03	17-7-0	32,307	19,706	.21	.13
5-20-10	17,117	44,710	.11	.29	19-19-0	0	3,560	.00	.02
5-20-20	87,676	300,808	.57	1.97	20-0-20	1,139	4,447	.01	.03
6-3-6	22,467	26,182	.15	.17					
6-4-6	8,053	11,047	.05	.07	176 Grades	15,008,790	14,853,606	97.12	97.35
6-4-8	14,588	21,204	.09	.14	Other specified grades ³	316,499	280,907	2.05	1.84
6-6-6	79,328	81,097	.52	.53	Grades not shown ⁴	128,663	123,540	.83	.81
6-6-8	16,968	14,169	.07	.09	Total ⁵	15,453,952	15,258,053	100.00	100.00
6-6-12	5,283	11,669	.03	.08					
6-6-18	9,729	11,874	.06	.08					
6-7-7	8,224	5,672	.05	.04					
6-8-2	2,276	3,929	.01	.03					
6-8-4	215,173	168,852	1.39	1.11					

¹ The tonnages of 48 grades were increased by amounts originally reported as "other specified grades." Their combined amount of increase was 12,194 tons.

² Less than 0.01 percent.

³ There were approximately 1,149 in 1952-53 and 1,044 in 1953-54.

⁴ There were, at least, 500 grades not shown by their guaranteed analysis.

⁵ Does not include the quantity of mixtures consumed in the Territories.

Table 3.—Consumption of Mixed Fertilizers, by Grades in Each State and Region,
Year Ended June 30, 1954¹

State	Fifteen Principal Grades Consumed in Regions															All Other Grades		Total Tons
	Tons															Num-ber ²	Tons	
New England																		
	5-10-10	6-9-12	8-12-12	6-3-6	8-16-16	8-12-16	5-8-7	7-7-7	10-10-10	0-15-30	5-10-5	6-9-9	8-9-10	0-14-14	6-8-8			
Maine	21,046	53,990	24,818		6,263	16,824	3,517	2,953	2,921	55	367	8,260	5,876	3,302	43	14,558	164,750	
New Hampshire	3,838		253		1,881	14	914	889	913	841	141			185	24	1,956	11,825	
Vermont	6,973		81		5,067	36	260	800	1,979	8,212	350			323	6	39	3,477	
Massachusetts	17,015			8,718	4,002	77	6,986	5,999	4,099	421	5,304			790	1,208	27	14,497	
Rhode Island	6,573				575	193	4	955	839	279	87			109	163	31	2,924	
Connecticut	10,644		1,060	16,704	2,179	64	4,184	3,189	2,452	1,828	3,886			925	4,050	51	14,038	
Total	66,089	53,990	26,787	25,422	19,585	17,019	16,816	14,669	12,643	11,444	10,802	8,260	5,876	5,634	5,427	106	51,450	
Middle Atlantic																		
	5-10-10	3-12-6	5-10-5	10-10-10	0-20-20	6-12-6	8-16-16	0-14-14	4-8-12	2-12-12	4-12-12	8-8-8	6-12-12	7-7-7	4-12-8			
New York	160,164	20,067	139,082	53,664	13,276	39,840	14,801	3,051		80	15	4,998	13,916	9,935	268	66	39,985	
New Jersey	151,211	3,149	30,007	7,172	3,268	511	1,068	4,308	481	106	43	13,687	1,733	8,452	5,290	56	35,552	
Pennsylvania	241,806	130,397	31,606	42,876	25,276	2,094	15,311	11,809	9,890	7,871	23,210	2,495	5,242	554	5,559	102	52,181	
Delaware	44,065	3,732	2,483	4,894	1,832		4,237	3,499	3,117	4,282	1,283	434	1,368	267	873	51	12,407	
District of Columbia	42	76	802	4					264	12				2	14	7	744	
Maryland	82,056	65,717	28,225	12,015	3,991		2,343	9,531	19,194	16,070	3,874	3,034	1,851	1,956	4,029	68	38,139	
West Virginia	21,766	16,937	4,348	2,598	4,087		237	2,818		1,710	99	10	535	2	4,488	38	8,216	
Total	701,110	240,075	236,553	123,223	51,730	42,445	37,997	35,016	32,886	30,131	28,524	24,658	24,647	21,180	20,514	180	187,224	
South Atlantic																		
	4-10-6	3-9-6	3-9-9	2-12-12	4-8-8	4-8-6	4-12-12	5-10-10	5-10-5	4-7-5	6-8-6	4-8-10	3-12-12	6-6-6	4-9-3			
Virginia	68	67,811	34,914	191,530			25	103,128	76,003		14,673	4,777	10		4,903	43	187,259	
North Carolina	323,195	350,440	158,704	142,960	295		10	148,818	46,542		63,288	72,013	32		50,626	41	133,723	
South Carolina	174,383	60,192	202,167		36,487		12,101	12,918	50,260		5,872		81,711		28		35,932	
Georgia	433	9,373	86,258	30,992	230,458	278,598	289,638	10,650	6,245	1	39,305		2,798	42	8,836	115	109,079	
Florida	617	35	5,600	2,825	90,656	41,932	7,183	4,694	6,387	130,529	6,199	10,669	2,297	80,387	12,077	767	669,443	
Total	498,696	487,851	487,643	368,307	357,896	320,530	308,957	280,208	185,437	130,530	129,337	87,459	86,848	80,429	76,442	931	1,135,436	
East North Central																		
	3-12-12	4-16-16	10-10-10	0-20-20	5-20-20	5-10-10	3-9-27	12-12-12	3-18-9	3-9-18	0-10-30	6-12-12	2-12-6	10-6-4	8-8-8			
Ohio	533,443	44,623	76,011	42,262	47,268	137,718	156	14,110	18,467	9,292	781	9,113	15,471	7,891	1,095	66	60,441	
Indiana	362,033	265,936	140,088	39,212	45,438	13,421	31,959	16,355	10,622	14,278	13,155	3,916	3,615	1,251	5,279	60	37,542	
Illinois	151,702	123,794	116,107	33,653	23,429	311	49,931	36,886	3,224	12,431	4,649	10,024	313	1,102	8,002	67	46,962	
Michigan	226,244	112,912	34,670	25,702	26,903	12,234	2,339	18,777	36,777	10,814	3,769	2,974	3,355	4,855	505	57	22,301	
Wisconsin	114,079	62,339	35,348	41,404	51,096	5	16,288	1,045	2,270	19,963	21,570	1,249		104	93	64	35,288	
Total	1,387,501	618,604	402,224	202,233	194,134	163,689	100,673	87,173	71,460	66,778	43,924	27,276	22,754	15,203	14,974	136	202,534	
West North Central																		
	10-10-10	5-20-20	3-12-12	8-24-8	10-20-0	12-12-12	4-16-16	8-32-0	4-12-4	0-20-20	15-15-0	8-8-8	4-24-12	5-20-10	6-24-12			
Minnesota	13,767	34,935	6,258	17	4,663	185	38,946	8,733		23,578	120	5	19,005	10,147	33,848	61	57,337	
Iowa	49,357	60,547	32,628	3,304	39,327	13,998	24,070	26,572	519	8,687	9,710	692	828	31,224	2,103	104	117,298	
Missouri	44,632	4,364	57,933	77,110	3,598	74,661	8,827	80	50,091	21,483	2,112	48,636	18,943			61	56,265	
North Dakota	302	158	267	24	841	35	797	10,388		53	123		2,052	136	3,741	35	4,141	
South Dakota	152	106	17	60	6,391	35	29	1,768	4	32	2,249		123	46	183	46	2,204	
Nebraska	857	143	96	886	13,683	1,285	24	10,345	102	732	20,023	23	361	27		43	17,359	
Kansas	2,275	49	1,219	16,994	27,436	757	112	10,121	6,101	468	18,493	460	689	2		38	14,394	
Total	111,342	100,302	98,418	98,395	95,939	90,956	72,805	68,007	56,817	55,033	52,830	49,816	42,001	41,582	39,875	159	268,998	
East South Central																		
	4-10-7	6-8-8	6-8-4	5-10-5	3-9-6	6-12-12	3-12-12	5-10-15	0-14-14	6-8-6	5-10-10	2-12-6	4-12-8	8-8-8	4-12-12			
Kentucky		1,438		4,460	29,510	5,149	66,188	68,022	2,265	55,474	28,730	45,489	41,741	10,705	586	64	92,836	
Tennessee	1,428	5,582	3,633	4,410	90,633	104,944	30,035	3,031	627	1,981	18,462	5,557	8,704	8,322	3,112	70	104,671	
Alabama	493,439	64,019	152,401	2,725	31	10	49		54,231	1,347	4	9	5	7,880	28,600	40	32,783	
Mississippi	6,091	165,490	7,411	126,052		5	1,310		7,801	88	9,700			14,050		25	16,410	
Total	500,958	236,529	163,445	137,647	120,174	110,108	97,582	71,233	64,924	58,890	56,896	51,055	50,450	40,957	32,298	131	246,700	
West South Central																		
	5-10-5	8-8-8	4-12-4	3-12-12	6-8-12	10-20-10	0-14-7	12-12-12	12-24-12	3-9-18	6-8-8	13-13-13	5-10-10	10-20-0	3-9-27			
Arkansas	63,176	5,632	9,264	3,210	36,302	9,089	1,332	7,650	1,302	18,318	61	2,104	1,193	23	10,406	57	24,735	
Louisiana	34,125	32,968	13,621	23,942	607	2,014	1,602	12,880	3,039	146	14,736	4,368	4,040	31	7	37	25,232	
Oklahoma	26,906	881	8,547	1,051	2	6,525	588	177	2,761	1,228		314	1,277	4,630		30	9,807	
Texas	113,058	25,198	16,251	10,906	510	11,279	20,146	2,917	13,138	62	116	6,034	5,172	6,736		94	49,864	
Total	237,265	64,679	47,483	39,109	37,421	28,907	23,668	23,624	20,240	19,754	14,913	12,820	11,682	11,440	10,413	158	109,642	
Mountain																		
	10-20-0	12-24-0	10-10-0	6-10-4	10-10-10	15-11-0	10-16-8	10-20-5	20-10-0	6-30-0	10-18-5	14-14-7	14-7-0	10-35-0	10-12-8			
Montana	2,603			225			1			790	268				19	347	4,234	
Idaho	635		1,313	66	2	2,047	1,062			18	287				39	1,033	6,746	
Wyoming	371	460		26						15	94	254		740	13	419	2,379	
Colorado	745	7,197		199	618		777			177	362	36		114	809	31	3,456	
New Mexico	370		31	66	7								296		18	1,377	2,147	
Arizona	3,382		4,254		1,483			2,017	1,624			735	628		46	7,339	21,462	
Utah	888		113	1,498	28	14	9			317	62				30	692	3,621	
Nevada	123			467								87			13	196	873	
Total	9,117	7,657	5,711	2,547	2,138	2,061	2,049	2,017	1,642	1,582	1,073	1,112	924	854	809	124	14,859	
Pacific																		
	10-10-5	17-7-0	8-8-4	6-10-4	8-10-12	13-3-12	6-8-10	10-16-8	5-10-10	6-9-6	16-10-0	4-10-10	6-20-20	10-12-10	10-20-20			
Washington		598	4	4,522		1,132		237	5,639				2,531		2,473	84	12,494	
Oregon		136	15	2	1,042	838		362	7,597	1,507			1,709		1,227	54	7,844	
California		27,318	19,267	18,454	6,094	10,205	8,023	7,894	65	94	6,669	5,810	5,264	11	3,772	2	584	
Total		28,052	19,286	18,456	11,658	10,205	9,693	8,256	7,899	7,240	6,669	5,810	5,264	4,251	3,772	3,702	600	
Territories ³																		
	12-4-8	12-6-10	14-4-10	15-4-7	12-4-10	13-3-12	6-8-10	10-16-8	8-6-10	10-6-14	9-10-5	12-3-16	12-10-5	16-4-5	12-2-10			
Puerto Rico	32,516	23,644	22,651	21,553	17,393	16,124	14,025	12,925	9,520	5,834	5,133	5,						

were favored over all other classes. More than 73 percent of the tonnage of all mixtures consumed in each of the other regions was of this class. N-P mixtures were consumed in largest tonnage in the Mountain region. For the United States, 90.40 percent of the tonnage of all mixtures was of the N-P-K class, while for the other classes—N-P, P-K, N-K—consumption was 2.46 percent, 5.76 percent, and 1.38 percent of the total tonnage, respectively. These proportions have not changed greatly from year to year. Over the past several years, however, the proportions of

Table 2a.—Ten Principal Grades of Mixed Fertilizers Consumed in Continental United States, Years Ended June 30, 1953 and 1954.

Grade	Consumption		Proportion of Total in Continental U. S. Consumption of Mixed Fertilizers	
	1952-53	1953-54	1952-53	1953-54
	Tons	Tons	Percent	Percent
3-12-12	2,241,137	1,730,944	14.50	11.34
5-10-5	1,115,741	1,287,746	7.22	8.44
10-10-10	877,240	821,116	5.68	5.38
4-16-16	401,079	701,365	2.60	4.60
3-9-6	473,321	698,177	3.06	4.58
4-10-7	671,216	608,256	4.34	3.99
4-10-6	527,094	552,416	3.41	3.62
3-9-9	581,802	498,719	3.76	3.27
2-12-12	455,699	489,239	2.95	3.31
Total	7,753,532	7,792,014	50.17	51.06

the N-P and N-K classes have steadily increased; in 1949-50, they were 1.45 and 0.60 percent, respectively.

The national weighted average primary nutrient content of mixed fertilizers increased from 25.84 per-

Table 4.—Principal Fertilizer Materials Consumed as Such, Year Ended June 30, 1954¹
TONS

State & Region	Chemical Nitrogen Materials					Natural Organics		Phosphate Materials				Potash Materials		Total Primary Nutrient Materials	Secondary and Trace Element Materials ²
	Ammonium Nitrate	Ammonium Sulfate	Calcium Cyanamide	Sodium Nitrate	Other ²	Dried Manures	Other ²	Phosphate Rock ³	Superphosphates Grades 22 Percent and Under	Superphosphates Grades Over 22 Percent	Other ²	Chlorides 50 & 60 Percent Grades	Other ²		
Maine	1,237	78	264	281	23	412	247	25	4,203	0	140	24	20	6,934	78
New Hampshire	939	28	49	125	58	165	420	34	2,007	0	67	64	20	3,976	11
Vermont	407	2	6	166	168	62	84	80	9,604	0	35	216	17	10,847	30
Massachusetts	1,144	57	205	1,195	141	1,862	5,765	319	3,809	0	770	488	0	15,763	139
Rhode Island	79	87	122	129	23	209	739	49	334	0	142	76	3	1,992	19
Connecticut	584	36	92	726	86	1,406	13,847	106	4,438	39	1,058	1,075	1,271	24,764	269
New England	4,390	288	738	2,622	499	4,116	21,102	613	24,395	39	2,220	1,943	1,331	64,296	546
New York	14,419	389	2,605	5,877	2,366	3,242	9,758	1,276	52,730	151	1,221	913	501	95,358	945
New Jersey	2,390	166	1,932	2,880	1,728	2,710	3,194	1,241	5,709	174	1,037	1,406	144	24,711	239
Pennsylvania	4,355	2,673	1,552	1,798	1,409	2,940	6,713	7,562	36,908	31	3,108	876	107	70,232	2,538
Delaware	2,124	24	246	167	1,738	135	209	106	720	80	100	296	35	5,988	128
District of Columbia	9	4	0	64	5	114	388	0	28	40	133	3	0	788	3
Maryland	1,472	114	1,256	3,662	1,762	731	579	1,677	6,239	12	465	265	1,999	20,233	285
West Virginia	766	392	9	1,757	364	399	672	465	4,292	46	79	57	1	9,299	33
Middle Atlantic	25,535	3,762	7,600	16,115	9,572	10,271	21,513	12,327	106,634	534	6,143	3,816	2,787	226,609	4,183
Virginia	5,237	124	1,440	30,300	27,581	659	1,022	3,427	9,977	301	1,145	1,605	14,681	97,499	16,463
North Carolina	15,091	346	8,873	141,248	115,469	360	1,697	1,995	17,595	89	10,044	10,360	10,624	333,791	24,762
South Carolina	24,841	679	1,529	99,154	85,780	405	798	1,512	20,247	3	8,396	19,066	3,944	266,354	2,744
Georgia	26,425	1,177	1,930	93,818	72,499	899	745	770	16,688	277	15,813	10,496	3,358	244,895	21,433
Florida	10,048	4,008	2,257	17,028	22,174	734	6,728	13,593	7,643	140	5,338	2,806	17,688	110,185	2,966
South Atlantic	81,642	6,334	16,029	381,548	323,503	3,057	10,990	21,297	72,150	810	40,736	44,333	50,295	1,052,724	68,368
Ohio	13,687	7,658	1,473	1,122	10,398	1,179	6,999	9,874	15,389	3,520	676	2,275	1,257	75,507	519
Indiana	45,919	6,511	2,415	270	27,723	1,045	1,476	27,012	17,411	5,655	590	19,972	412	156,141	487
Illinois	36,942	35,037	1,300	117	46,555	4,657	7,184	563,876	64,420	12,067	8,303	93,153	251	873,862	765
Michigan	13,000	6,498	311	664	4,314	2,973	8,570	3,507	11,761	361	595	1,193	563	54,310	851
Wisconsin	8,652	154	84	0	2,552	952	6,034	12,836	2,810	135	103	3,943	572	38,827	235
East North Central	118,200	55,858	5,583	2,173	91,542	10,806	30,263	617,105	111,521	21,738	10,267	120,536	3,035	1,198,647	2,857
Minnesota	13,249	1,046	35	6	10,744	525	3,408	5,120	10,796	17,673	6,959	1,346	0	70,907	324
Iowa	49,140	4,907	284	0	47,423	147	3,216	23,423	52,772	10,670	32,632	6,739	369	231,222	72
Missouri	44,004	9,249	20	246	33,826	990	2,331	158,644	8,387	4,940	5,023	18,811	1,279	287,750	135
North Dakota	425	70	0	0	85	0	31	40	90	14,919	8,925	14	0	24,999	20
South Dakota	3,103	403	3	7	1,835	0	104	161	1,841	4,997	4,139	13	2	16,608	0
Nebraska	40,754	4,045	0	0	47,302	1,761	909	4,953	4,998	17,052	11,182	128	0	132,584	586
Kansas	25,826	5,943	0	0	11,608	291	1,321	7,908	3,556	23,933	35,047	776	0	116,209	110
West North Central	176,501	25,663	342	259	152,823	3,714	11,320	200,249	81,440	94,184	103,907	27,827	1,650	879,879	1,247
Kentucky	29,705	1,272	1,659	2,221	3,956	320	219	8,133	46,655	4,200	12,133	8,916	9,315	128,704	106
Tennessee	37,049	370	1,054	18,745	9,318	752	751	624	20,098	6,303	18,036	5,101	128,570	392	0
Alabama	52,602	1,280	834	98,370	46,660	467	200	3,415	39,631	437	89,930	10,956	130	344,912	1,049
Mississippi	113,997	6,630	11,545	60,283	58,335	19	0	6,783	37,938	1,473	60,553	22,531	208	380,295	25
East South Central	233,353	9,552	15,092	179,619	118,269	1,558	1,170	18,955	144,322	12,413	180,652	52,772	14,754	982,481	1,572
Arkansas	39,150	10,859	12,055	32,086	23,545	49	0	2,580	16,609	4,570	3,209	31,179	983	176,874	6
Louisiana	28,483	11,229	1,061	34,144	28,464	156	413	3,230	16,063	1,406	12,829	6,739	75	144,292	512
Oklahoma	11,589	2,471	0	413	2,029	701	449	14,106	32,446	6,319	8,359	1,474	20	80,376	100
Texas	33,532	40,673	1,925	2,575	29,834	2,229	3,351	18,246	74,868	17,827	50,653	1,269	21	276,983	2,625
West South Central	112,754	65,232	15,041	69,218	83,872	3,135	4,213	38,162	139,986	30,122	75,030	40,661	1,099	678,525	3,243
Montana	5,260	2,735	0	0	0	20	0	0	10	13,354	2,795	10	0	24,184	684
Idaho	13,754	19,227	572	0	1,677	68	30	0	12,664	18,475	11,116	85	2	77,670	5,538
Wyoming	1,069	457	0	0	389	0	44	0	315	4,754	741	0	0	7,772	1,081
Colorado	5,493	2,158	0	0	3,775	426	681	200	1,653	14,043	3,141	170	65	31,785	1,299
New Mexico	1,466	706	0	1	3,473	33	682	0	4,891	4,938	4,010	0	0	20,200	15
Arizona	13,490	25,037	678	969	36,915	1,539	623	40	4,868	4,110	23,935	36	658	112,898	20,841
Utah	4,483	8,085	0	0	1,076	207	221	0	4,031	4,854	1,484	38	0	24,483	313
Nevada	148	405	0	12	286	29	106	0	154	544	854	3	0	2,541	5,741
Mountain	45,167	58,810	1,250	982	47,591	2,325	2,367	240	28,586	65,072	48,076	342	725	301,533	35,512
Washington	32,557	32,334	319	204	21,220	452	2,121	850	8,595	7,678	16,377	2,431	134	125,272	46,369
Oregon	23,558	36,760	698	0	10,066	425	671	280	11,774	2,856	22,125	1,436	74	110,723	14,698
California	71,079	172,230	5,521	243	187,283	220,000 ⁴	54,399	1,604	51,948	11,615	86,393	1,300	4,259	867,874	436,828
Pacific	127,194	241,324	6,538	447	218,569	220,877	57,191	2,734	72,317	22,149	124,895	5,167	4,467	1,103,869	497,895
Continental U. S.	924,736	466,823	68,213	652,983	1,046,240	259,859	160,129	911,682	781,351	247,061	591,926	297,397	80,163	6,488,563	615,423
Hawaii	0	30,528	0	122	24,533	9	70	994	5,226	40	5,474	12,178	1,620	80,794	90
Puerto Rico	0	39,365	0	0	6,860	0	1	0	350	41	741	160	35	47,553	0
Alaska ⁵	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Territories	0	69,893	0	122	31,393	9	71	994	5,576	81	6,215	12,338	1,655	128,347	90
Totals: 1953-54	924,736	536,716	68,213	653,105	1,077,633	259,868	160,200	912,676	786,927	247,142	598,141	309,735	81,818	6,616,910	615,513
1942-53	846,252	534,749	82,219	647,483	876,596	207,127	151,910	1,176,962	1,046,827	248,850	636,996	282,465	74,461	6,812,897	877,487
1951-52	799,189	486,817	42,254	681,761	572,903	198,726	145,089	1,160,020	1,224,290	225,059	704,787	246,576	73,548	6,561,019	785,050

¹ Includes materials distributed by Government agencies. Excludes lime and materials used by manufacturers in the formulation of commercial mixture.

² The principal commodities are shown in Table 3, by regions.

³ Includes colloidal phosphate, the quantity of which is shown separately, by regions, in Table 5.

⁴ Estimated.

⁵ Not available.

**Table 5.—Kinds of Fertilizers Consumed in Regions of the United States,
In Tons, During Year Ended June 30, 1954¹**

Kinds	New England	Middle Atlantic	South Atlantic	East North Central	West North Central	East South Central	West South Central	Mountain	Pacific	Territories ²	Total
MIXTURES: N-P-K	326,587	1,733,122	4,631,903	3,315,152	990,949	1,895,358	645,286	21,244	228,950	261,098	14,049,649
N-P	94	92	1,989	2,442	271,241	72	29,092	34,848	39,795	3,317	382,982
P-K	25,232	104,655	194,184	302,825	80,824	143,935	38,305	79	2,182	2,393	894,814
N-K	0	44	193,930	715	102	481	177	21	1,946	16,215	213,631
CHEMICAL NITROGEN MATERIALS											
Ammonia, anhydrous	3	3	3	3	3	3	3	3	3	3	350,474
Ammonium nitrate	4,390	25,535	81,642	118,200	176,501	233,353	112,754	45,147	127,194	0	924,716
Ammonium nitrate-limestone mixture	170	3,324	291,066	17,464	14,740	60,222	3,485	52	80	0	390,603
Ammonium sulfate	288	3,762	6,334	55,858	25,663	9,552	65,232	58,830	241,324	69,893	536,736
Calcium cyanamide	738	7,600	16,029	5,583	342	15,092	15,041	1,250	6,538	0	68,213
Calcium nitrate	0	0	12,351	37	40	219	0	4,647	33,297	103	50,694
Nitrogen solutions ⁴	0	2,116	5,083	13,132	34,193	595	4,390	14,189	95,978	21,916	191,592 ⁵
Sodium nitrate	2,622	16,115	381,548	2,173	259	179,619	69,218	982	447	122	653,105
Other ⁶	329	4,132	15,003	66,909	103,850	57,233	75,997	28,703	89,214	9,374	94,270 ⁷
NATURAL ORGANIC MATERIALS											
Blood, dried	0	145	80	0	0	0	0	15	1,536	0	1,776
Castor Pomace	3,039	70	2,998	0	0	0	0	85	1,494	0	9,686
Compost	85	4,288	1,131	235	4,196	0	1,952	0	3	0	11,892
Cottonseed meal ⁸	7,880	61	1,352	2	0	0	2	0	7	1	9,305
Fish scrap, meal, and emulsions	431	2	0	0	0	0	0	1	1,060	0	1,494
Manures, dried	4,116	10,271	3,057	10,806	3,714	1,558	3,135	2,325	220,877	9	259,888
Sewage sludge, activated	4,415	9,953	3,001	26,090	6,531	1,164	2,259	2,191	14,345	70	70,021
Sewage sludge, other	0	0	0	1,235	591	0	0	0	29,017	0	30,843
Tankage, animal	0	161	10	0	0	0	0	0	311	0	482
Tankage, garbage	0	12	9	0	0	0	0	0	0	0	21
Tankage, process	2,398	6,817	2,089	2,701	0	6	0	0	492	0	14,503
Other ⁹	854	2	320	0	0	0	0	75	8,926	0	10,177
PHOSPHATE MATERIALS											
Ammonium phosphate: 11-48	0	1	256	0	10,865	0	71	5,076	14,000	2,797	33,066
Ammonium phosphate: 16-20 ¹⁰	0	15	69	1,098	56,895	87	60,647	34,172	87,527	2,355	242,865
Ammonium phosphate: 13-39	0	0	0	260	21,023	0	4,151	2,159	4,978	0	32,571
Ammoniated superphosphate ¹¹	0	0	72	0	0	0	0	929	6,651	741	8,393
Basic lime phosphate	0	0	938	0	0	2,768	0	0	0	0	3,726
Basic slag	0	2,006	33,491	0	0	151,268	8,511	0	0	0	195,270
Bonemeal, raw	246	360	272	97	61	28	118	7	973	0	2,162
Bonemeal, steamed	1,504	3,677	1,134	1,362	1	418	544	1	1,016	0	9,657
Calcium metaphosphate	0	90	1,861	5,628	14,869	5,355	245	140	101	0	28,289
Fused tricalcium phosphate	0	0	1,455	1,822	33	20,728	204	0	0	0	24,242
Phosphoric acid: 52-54%	0	0	0	0	0	0	38	5,561	9,647	0	15,246
Phosphate rock	613	11,127	20,386	606,379	190,622	7,940	35,700	200	2,414	994	876,375
Colloidal phosphate	0	1,200	911	10,726	9,627	11,015	2,462	40	320	0	36,301
Precipitated bone	470	0	0	0	0	0	0	0	0	0	470
Superphosphate: 18%	4,729	15,974	40,867	34,102	17,882	33,472	208	3,307	30,076	0	180,617
Superphosphate: 19%	3,939	10	1,146	21	262	1,006	0	18,735	40,298	0	65,417
Superphosphate: 20-22%	15,727	90,650	30,137	77,398	63,296	109,844	139,778	6,544	1,943	5,576	540,893
Superphosphate: 23-41%	0	211	0	382	2,572	26	2,781	920	55	0	6,947
Superphosphate: 42-44%	0	0	0	0	25,553	0	0	35,599	10,168	0	71,320
Superphosphate: 45%	0	205	70	16,521	35,403	1,327	23,316	8,898	3,597	1	89,338
Superphosphate: 46%	0	29	280	1,774	13,798	1,224	412	16,951	6,454	80	41,002
Superphosphate: 47%	39	65	99	612	14,567	8,532	495	2,532	585	0	27,526
Superphosphate: 48%	0	0	361	1,765	1,840	1,145	786	77	1,290	0	7,262
Superphosphate: 49-50%	0	24	0	684	451	161	2,332	95	0	0	3,747
Other ¹²	0	0	1,168	0	160	0	501	31	2	322	2,184
POTASH MATERIALS											
Cotton hull ashes	889	8	52	0	0	0	0	0	0	0	949
Lime-potash mixtures: 5-10% ¹³	0	1,943	21,040	0	0	2,700	0	0	0	0	25,683
Manure salts: 20-30%	0	8	1,714	173	500	4	546	0	0	0	2,945
Potassium carbonate	0	0	154	0	0	0	0	0	0	0	154
Potassium chloride: 50%	34	187	21,206	6,567	1,798	11,389	10,051	31	993	800	53,036
Potassium chloride: 60%	1,909	3,629	23,127	113,969	26,329	41,383	30,610	311	4,174	11,538	256,979
Potassium magnesium sulfate	146	243	3,299	1,971	848	952	491	0	8	3	7,961
Potassium nitrate	188	7	0	0	0	0	0	0	0	0	195
Potassium phosphate ash ¹¹	0	0	0	0	0	12	0	0	0	0	12
Potassium sodium nitrate ¹¹	19	0	11,045	0	0	596	40	180	0	0	11,880
Potassium sulfate	89	563	7,008	911	2	10,489	22	545	4,459	1,652	25,740
Tobacco stems	0	15	527	0	0	1	0	0	0	0	543
Wood ashes	0	0	5,456	0	0	0	0	0	0	0	5,456
TOTAL PRIMARY NUTRIENT FERTILIZERS	416,209	2,064,522	6,074,730	4,819,781	2,222,995	3,022,327	1,391,585	357,725	1,376,742	411,370	22,157,986
SECONDARY & TRACE ELEMENT MATERIALS⁸											
Aluminum sulfate	4	13	0	1	0	3	0	0	88	0	109
Borax	82	267	615	339	6	538	5	0	844	0	2,696
Calcium sulfate (gypsum)	406	3,241	66,185	1,865	1,241	967	1,200	29,204	472,471	0	576,780
Copper sulfate	0	56	170	166	0	2	0	2	154	0	550
Ferrous sulfate	0	0	18	0	0	0	0	64	518	0	602
Magnesium carbonate	0	0	0	0	0	0	0	0	6,122	0	6,122
Magnesium sulfate	18	158	1,041	23	0	0	0	6	119	14	1,379
Manganese sulfate	26	136	126	428	0	4	0	0	83	0	803
Mixed Minerals	0	144	11	3	0	6	21	79	2,717	0	2,981
Sulfur: 25-99+%	10	140	122	28	0	1	2,017	5,414	10,489	0	18,221
Sulfuric acid: 40-93%	0	0	0	0	0	0	0	741	2,298	0	3,039
Zinc sulfate	0	28	80	2	0	51	0	2	1,992	76	2,231
TOTAL SECONDARY & TRACE ELEM. MAT.	546	4,183	68,368	2,857	1,247	1,572	3,243	35,512	497,895	90	615,513
TOTAL ALL FERTILIZERS	416,755	2,068,705	6,143,098	4,822,638	2,224,242	3,023,899	1,394,828	393,237	1,874,637	411,460	22,773,499

¹ Includes distribution by Government agencies. Does not include the quantities of materials used for manufacture of commercial mixtures.

² Excludes Alaska as data was not available.

³ Included with "Other Chemical Nitrogen materials." Regional data cannot be published without disclosing operations of individual suppliers.

⁴ Includes aqua ammonia.

⁵ Contains 26.83 percent nitrogen.

⁶ Anhydrous ammonia, ammonium sulfate-nitrate, urea, and chemical nitrogen materials not classified.

⁷ Does not include above total for anhydrous ammonia.

⁸ Excludes materials distributed by other than manufacturers of fertilizers.

⁹ Meals: Crab (2), Hoof and Horn (475), Linseed (583), Lupine (56), Seed (313), Soybean (219), Tung (166), Vegetable (98), Peat (23)¹⁰; and organics not classified 8,242 tons.

¹⁰ Includes quantities reported as 16-20-0 mixture.

¹¹ Additional quantities may have been reported as mixed grades.

¹² Not classified.

¹³ Includes cement flue dust. Additional quantities are given free to farmers for which no records are kept.

cent in 1952-53 to 26.87 percent in 1953-54 (Table 7). The average, for 1953-54, comprised nitrogen, 5.01; available P_2O_5 , 11.59; and K_2O , 10.27 percent. The average percentages of these nutrients in 1952-53 were 4.63, 11.34, and 9.87 respectively. As compared with 1952-53, the increase in the average was 8.21 percent for nitrogen, 2.20 percent for available P_2O_5 , and 4.05 percent for K_2O . The average primary nutrient content of all mixtures consumed in each State and Territory is shown in Table 7. These averages for the 51 political units covered showed for nitrogen increases in 44 and decreases in 7; for available P_2O_5 increases in 34 and decreases in 17; for K_2O , increases in 35 and decreases in 16; and for total primary nutrients, increases in 42 and decreases in 9.

MATERIALS

The consumption of fertilizer materials for direct application amounted to 7,232,423 tons in 1953-54 as compared with 7,690,384 tons in 1952-53. The quantity, in 1953-54, comprised chemical nitrogen materials 3,260,403 tons, phosphate materials (including ammonium phosphates) 2,544,886 tons, natural organics 420,068 tons, potash materials (including nitrate of potash, nitrate of soda-potash, and lime-potash) 391,553 tons, and secondary and trace element materials 615,513 tons. Compared with 1952-53 there was an increase of 273,104 tons in chemical nitrogen materials, 61,031 tons in natural organics and 34,627 tons in potash materials. Decreases of 564,749 tons and 261,974 tons were shown in phosphate materials and secondary and trace element materials respectively. The consumption of the principal materials comprising these classes is shown by States and regions in Tables 4 and 5.

In chemical nitrogen materials the principal changes from the previous year were increases in anhydrous ammonia (from 217,182 to 350,474 tons), nitrogen solutions including aqua ammonia (from 72,917 to 191,592 tons), and ammonium nitrate (from 846,252 to 924,716 tons). Among the natural organics, the consumption of dried manures increased from 207,127 to 259,868 tons.

Of the phosphate materials, the consumption of ammonium phosphates (11-48 and 16-20 grades) increased from 226,222 to 275,931 tons, while decreases were shown for basic slag (301,537 to 195,270 tons), phosphate rock (1,176,962 to 912,676 tons), and superphosphates grading 22 percent and under (1,046,827 to 786,927 tons). The total quantity of

phosphate rock used in Illinois and Missouri, the two largest consuming States, was 722,520 tons in 1953-54, compared with 954,491 tons in 1952-53. The consumption of superphosphates grading 22 percent and under was below that in 1952-53 in 42 of the 51 States and other political units; total consumption of these grades amounted to only 42.38 percent of that in 1949-50.

The 60-percent grade of potassium chloride was greatly favored over the 50-percent grade; the respective consumptions of these grades were 256,979 and 53,056 tons, as compared with 172,210 and 110,255 tons in 1952-53.

The total consumption of gypsum decreased from 837,422 tons in 1952-53 to 576,780 tons in 1953-54. The consumption in California alone decreased from 719,788 to 414,067 tons.

The weighted average primary nutrient content of the principal classes of materials consumed is given in Table 7. These averages are based on the composition and tonnage of the individual materials comprising the several classes. For materials containing only nitrogen, P_2O_5 , or K_2O , the respective national averages were 30.81, 15.70 (available P_2O_5), and 54.01 percent, while the multiple-nutrient materials averaged 17.53 percent. The corresponding averages for these classes in 1952-53 were 28.54, 14.48, 51.89, and 21.96 percent. With the exception of the multiple-nutrient materials, the national averages were higher than in 1952-53. This reflects the greater use of higher analysis products. The drop in the average concentration of multiple-nutrient materials was largely the result of the increase in consumption of dried manures, which have a low content of primary nutrients.

PRIMARY NUTRIENTS

The quantities of primary nutrients in fertilizers are based on the average analyses of the various products as published by fertilizer control officials for the State in which they were consumed, rather than on the manufacturers' guarantees. Thus, the overruns or underruns of nutrients from the guarantees are taken into account. This gives more nearly the actual tonnages of nutrients than would be the case if only the guarantees were used. The actual nutrient content usually averages somewhat higher than the guarantee.

Fertilizers consumed in the United States and Territories in 1953-54 contained 1,847,416 tons of nitrogen, 2,242,100 tons of available P_2O_5 (2,-

646,971 tons of total P_2O_5), and 1,806,042 tons of K_2O (Table 6). Compared with 1952-53, the quantity of nitrogen increased 210,360 tons (12.85 percent) and of K_2O 67,792 tons (3.90 percent), while available P_2O_5 and total P_2O_5 decreased 28,650 tons (1.26 percent) and 118,317 tons (4.28 percent), respectively.

The annual consumption of primary nutrients in the United States and Territories for the years 1943-44 to 1953-54 is shown in Figure 1. During the period of 1945-46 to 1949-50 the consumption of nitrogen increased at the rate of approximately 75,000 tons annually, whereas the annual rate of increase in subsequent years was about 210,000. In general, the consumption of K_2O has paralleled that of nitrogen, but with a decreasing trend in the annual rate of increase since 1950-51. It will be noted that in 1953-54 the consumption of K_2O was lower than that of nitrogen for the first time during the period 1943-44 to 1953-54. Also for the first time during this period, the consumption of available P_2O_5 took a downward turn in 1953-54.

The quantities and proportions of the nutrients consumed as mixed fertilizers in 1953-54 were 778,099 tons (42.12 percent) for nitrogen, 1,801,423 tons (80.35 percent) for available P_2O_5 , 1,930,260 tons (72.92 percent) for total P_2O_5 , and 1,596,032 tons (88.37 percent) for K_2O . The quantities of nitrogen, available P_2O_5 , total P_2O_5 , and K_2O consumed as mixed fertilizers were, respectively, 6.87, 1.07, 0.51, and 2.83 percent greater than in 1952-53.

The quantities and proportions of the nutrients consumed as fertilizer materials in 1953-54 were 1,069,317 tons (57.88 percent) for nitrogen, 440,677 tons (19.65 percent) for available P_2O_5 , 716,711 tons (27.08 percent) for total P_2O_5 , and 210,010 tons (11.63 percent) for K_2O . The quantities of nitrogen and K_2O consumed as materials were, respectively, 17.64 and 12.78 percent greater than in 1952-53, while the quantities of available P_2O_5 and total P_2O_5 were, respectively, 9.78 and 15.16 percent less.

The total primary nutrient content of mixed fertilizers consumed in 1953-54 amounted to 4,175,554 tons, or 2.78 percent more than the consumption (4,062,422 tons) in 1952-53. The total primary nutrient content of fertilizer materials in 1953-54 was 1,720,004 tons, or 8.61 percent more than that (1,583,634 tons) in 1952-53.

The 1953-54 consumption of fertilizer materials containing primary nutrients was 195,987 tons (2.88 per-

**Table 6.—Consumption of Primary Plant Nutrients in Fertilizers,
Year Ended June 30, 1954¹**
TONS

State & Region	In Mixtures					In All Fertilizers				
	Nitrogen	P ₂ O ₅		K ₂ O	Total N, Avail. P ₂ O ₅ , & K ₂ O	Nitrogen	P ₂ O ₅		K ₂ O	Total N, Avail. P ₂ O ₅ , & K ₂ O
		Available	Total				Available ²	Total ³		
Maine	11,046	17,576	18,386	20,397	49,019	11,620	18,471	19,305	20,435	50,526
New Hampshire	626	1,427	1,513	1,553	3,606	1,021	1,873	1,987	1,604	4,498
Vermont	1,191	3,665	3,793	4,953	9,809	1,414	5,740	6,054	5,089	12,243
Massachusetts	4,044	6,469	6,752	6,511	17,024	5,189	7,605	8,003	6,881	19,675
Rhode Island	736	1,340	1,419	1,356	3,432	889	1,468	1,564	1,410	3,767
Connecticut	3,764	5,678	6,041	6,209	15,651	5,110	7,394	7,863	7,552	20,056
New England	21,407	36,155	37,904	40,979	98,541	25,243	42,551	44,776	42,971	110,765
New York	29,265	57,826	60,410	46,512	133,603	37,290	69,196	72,595	47,411	153,897
New Jersey	14,027	27,751	29,172	26,604	68,382	16,745	29,330	31,136	27,575	73,650
Pennsylvania	28,378	72,700	75,579	62,683	163,761	32,046	81,258	86,554	63,357	176,661
Delaware	4,302	9,845	10,265	10,016	24,163	5,800	10,081	10,541	10,219	26,100
District of Columbia	110	182	196	123	415	154	252	268	129	535
Maryland	12,688	33,053	35,172	28,189	73,930	14,812	34,526	37,168	28,491	77,829
West Virginia	2,689	8,598	9,100	6,312	17,399	3,452	9,372	10,244	6,359	19,183
Middle Atlantic	91,459	209,755	219,894	180,439	481,653	110,299	234,015	248,506	183,541	527,855
Virginia	24,283	75,356	80,492	69,666	169,305	37,246	78,147	84,335	71,976	187,369
North Carolina	59,297	141,628	152,710	125,648	326,573	115,540	146,514	158,331	133,517	395,571
South Carolina	25,316	66,675	71,596	56,492	148,483	68,063	71,684	77,210	68,673	208,420
Georgia	44,865	104,980	113,426	99,478	249,323	88,500	110,421	119,377	106,374	305,295
Florida	58,780	82,118	97,566	78,915	219,813	72,875	84,869	104,334	82,536	240,280
South Atlantic	212,541	470,757	515,790	430,199	1,113,497	382,224	491,635	543,587	463,076	1,336,935
Ohio	41,661	130,336	139,452	129,078	301,075	53,323	135,607	147,766	130,873	319,803
Indiana	44,500	140,821	149,818	150,456	335,777	74,504	148,071	165,002	162,423	384,998
Illinois	32,913	84,799	90,297	94,486	212,198	82,166	124,109	293,239	151,955	358,230
Michigan	22,360	76,413	81,183	75,467	174,240	30,831	79,505	85,359	75,464	186,800
Wisconsin	14,517	58,516	62,200	69,213	142,246	19,736	59,755	67,088	71,803	151,294
East North Central	155,951	490,885	522,950	518,700	1,165,536	260,560	547,047	738,454	593,518	1,401,125
Minnesota	12,187	50,726	53,094	36,724	99,637	24,202	64,881	69,089	37,556	126,639
Iowa	28,764	75,396	78,621	41,383	145,545	76,119	102,398	112,932	45,525	224,042
Missouri	33,281	70,105	75,728	52,470	155,856	72,523	80,929	132,382	64,226	217,678
North Dakota	1,653	6,191	6,496	1,266	9,110	2,924	16,541	17,185	1,275	20,740
South Dakota	1,326	2,779	2,991	208	4,313	4,311	6,579	6,956	217	11,107
Nebraska	7,452	13,371	13,520	1,583	22,406	52,696	25,172	27,009	1,698	79,566
Kansas	9,719	20,244	21,431	3,495	33,458	33,262	41,890	45,752	3,979	79,131
West North Central	94,382	238,812	251,881	137,131	470,325	266,037	338,390	411,305	154,476	758,903
Kentucky	19,200	50,528	55,424	48,158	117,886	31,908	66,589	74,329	57,961	156,458
Tennessee	16,832	44,372	47,923	38,615	99,819	38,744	55,654	59,887	46,086	140,484
Alabama	35,282	84,499	91,205	63,745	183,526	80,634	101,709	110,923	70,285	252,628
Mississippi	20,334	33,797	36,423	26,793	80,924	112,299	48,570	53,888	39,536	200,405
East South Central	91,648	213,196	230,975	177,311	482,155	263,585	272,522	299,027	213,868	749,975
Arkansas	10,648	21,210	22,644	22,690	54,548	52,102	27,510	29,657	41,045	120,657
Louisiana	10,973	19,922	21,214	15,689	46,584	49,574	25,802	28,299	19,574	94,950
Oklahoma	4,136	9,368	9,849	3,888	17,392	11,435	21,415	25,764	4,799	37,649
Texas	17,755	35,174	37,064	18,771	71,700	68,669	70,142	77,942	19,623	158,434
West South Central	43,512	85,674	90,771	61,038	190,224	181,780	144,869	161,662	85,041	411,690
Montana	397	899	996	42	1,338	3,141	8,027	8,578	49	11,217
Idaho	701	926	986	136	1,763	12,494	14,996	16,070	191	27,681
Wyoming	267	584	612	44	895	1,097	3,011	3,092	44	4,152
Colorado	1,632	3,286	3,350	530	5,448	7,005	11,719	11,969	680	19,404
New Mexico	246	322	341	49	617	4,086	4,567	4,704	54	8,707
Arizona	2,586	3,241	3,363	627	6,454	32,495	12,358	12,561	956	45,789
Utah	300	570	598	107	977	4,580	3,960	4,093	134	8,674
Nevada	68	109	115	37	214	414	546	568	40	1,000
Mountain	6,197	9,937	10,361	1,572	17,705	65,312	59,164	61,635	2,148	126,624
Washington	2,037	3,944	4,089	3,187	9,168	36,243	13,704	14,297	4,709	54,656
Oregon	2,020	3,382	3,609	2,109	7,511	25,640	12,334	12,858	3,028	41,002
California	23,858	22,037	22,973	12,294	58,189	172,965	65,715	68,184	20,300	258,986
Pacific	27,915	29,363	30,671	17,390	74,868	234,848	91,753	95,339	28,037	354,638
Continental U. S.	745,012	1,784,534	1,911,197	1,564,939	4,094,505	1,789,888	2,221,946	2,624,291	1,766,676	5,778,510
Hawaii	6,180	5,269	5,754	9,334	20,783	20,964	8,324	9,160	17,513	46,801
Puerto Rico	26,907	11,620	13,309	21,739	60,266	36,564	11,830	13,520	21,853	70,247
Alaska ⁴										
Territories	33,087	16,889	19,063	31,073	81,049	57,528	20,154	22,680	39,366	117,048
Total: 1953-54	778,099	1,801,423	1,930,260	1,596,032	4,175,554	1,847,416	2,242,100	2,646,971	1,806,042	5,893,558
1952-53⁵	728,095	1,782,286	1,920,472	1,552,041	4,062,422	1,637,056	2,270,730	2,765,298	1,738,230	5,646,056
1951-52	648,223	1,680,705	1,806,523	1,420,395	3,749,323	1,422,160	2,199,376	2,678,070	1,581,467	5,203,003

¹ Includes Government distribution.

² Includes, as available P₂O₅, 2 percent of the colloidal phosphate and 3 percent of the phosphate rock marketed for direct application.

³ Includes, as total P₂O₅, 22 percent of the colloidal phosphate and 32 percent of the phosphate rock marketed for direct application.

⁴ Not available. In 1952-53, total primary plant nutrients in all fertilizers amounted to 273 tons.

⁵ Revised. Excess quantities of 1,960 tons of K₂O in mixtures in Kansas and 2,702 tons of total P₂O₅ in all fertilizers in Idaho were reported for 1952-53.

**Table 7.—Weighted Average Content of Primary Plant Nutrients in Fertilizers
in Percent, Year Ended June 30, 1954¹**

State & Region	Mixtures ²				Materials ³					Total Nutrients in Mixtures and Materials
	N	Available P ₂ O ₅	K ₂ O	Total Nutrients	N	Available P ₂ O ₅ ⁴	K ₂ O	Multiple Nutrients ²	Total Nutrients	
Maine	6.70	10.67	12.38	29.75	28.51	19.91	53.42	12.23	21.67	29.43
New Hampshire	5.29	12.07	13.13	30.49	29.54	20.35	53.56	10.41	22.43	28.47
Vermont	4.32	13.30	17.97	35.59	28.44	21.28	60.87	13.87	22.44	31.87
Massachusetts	5.85	9.36	9.42	24.63	18.76	18.46	60.38	11.29	16.82	23.18
Rhode Island	5.47	9.96	10.08	25.51	17.53	17.86	59.07	11.98	16.82	24.39
Connecticut	5.77	8.71	9.52	24.00	21.33	22.21	56.45	13.07	17.79	22.29
New England	6.08	10.27	11.64	27.99	22.73	20.66	57.69	12.48	19.01	26.61
New York	5.70	11.27	9.06	26.03	25.92	20.01	55.02	10.05	21.28	25.29
New Jersey	5.27	10.43	10.00	25.70	24.14	17.01	57.07	11.38	21.32	25.33
Pennsylvania	4.67	11.95	10.31	26.93	25.06	17.35	57.07	10.08	18.37	26.04
Delaware	4.85	11.09	11.28	27.22	34.49	22.59	59.82	9.06	32.35	27.54
District of Columbia	5.77	9.54	6.45	21.76	13.37	35.09	60.56	13.02	15.18	19.85
Maryland	4.34	11.32	9.65	25.31	24.66	16.83	12.65	12.08	19.27	24.92
West Virginia	3.96	12.38	9.30	25.64	21.62	19.22	59.74	9.92	19.18	24.86
Middle Atlantic	4.98	11.41	9.82	26.21	25.63	18.61	41.52	10.47	20.39	25.57
Virginia	3.54	11.00	10.17	24.71	19.91	18.43	14.05	10.13	18.53	23.94
North Carolina	3.98	9.50	8.43	21.91	19.96	16.18	37.38	11.62	20.67	21.68
South Carolina	3.77	9.92	8.41	22.10	20.10	16.22	53.21	20.26	22.50	22.21
Georgia	4.07	9.52	9.02	22.61	22.11	16.02	54.53	19.77	22.86	22.65
Florida	5.49	7.66	7.36	20.51	22.09	9.02	42.35	15.46	18.58	20.33
South Atlantic	4.23	9.37	8.57	22.17	20.66	14.99	40.16	15.63	21.22	22.01
Ohio	4.09	12.80	12.68	29.57	32.45	16.80	49.15	10.91	24.80	29.24
Indiana	4.34	13.75	14.69	32.78	36.07	14.19	58.58	9.99	31.52	32.62
Illinois	5.21	13.43	14.96	33.60	40.34	5.97	61.40	11.23	16.71	23.80
Michigan	4.10	14.01	13.84	31.95	31.94	16.62	51.37	9.11	23.13	31.16
Wisconsin	3.61	14.55	17.21	35.37	37.38	6.56	56.52	9.74	23.30	34.31
East North Central	4.31	13.56	14.32	32.19	37.17	7.16	60.22	10.28	19.65	29.07
Minnesota	4.84	20.16	14.60	39.60	45.45	34.11	59.44	28.97	38.08	39.27
Iowa	6.83	17.91	9.83	34.57	42.53	21.32	57.89	38.42	33.95	34.36
Missouri	7.10	14.96	11.19	33.25	44.27	5.74	58.33	23.27	21.48	28.77
North Dakota	7.17	26.85	5.49	39.51	33.17	45.36	60.50	51.78	47.28	43.52
South Dakota	9.90	20.74	1.55	32.19	44.89	39.69	55.10	37.62	40.91	37.01
Nebraska	11.30	20.28	2.40	33.98	47.29	33.66	60.50	33.23	43.11	40.08
Kansas	9.76	20.33	3.51	33.60	41.99	33.02	57.38	41.93	39.30	36.67
West North Central	7.03	17.78	10.21	35.02	44.35	18.85	58.26	38.50	32.80	34.14
Kentucky	4.24	11.16	10.64	26.04	32.69	22.56	53.73	7.99	29.97	26.91
Tennessee	4.26	11.23	9.77	25.26	32.74	24.93	49.30	14.50	31.63	26.82
Alabama	4.21	10.09	7.61	21.91	22.69	12.87	59.27	13.61	20.03	21.36
Mississippi	5.74	9.54	7.56	22.84	36.65	13.83	56.04	30.65	31.42	27.28
East South Central	4.49	10.45	8.69	23.63	30.89	16.62	54.43	13.94	27.26	24.81
Arkansas	5.49	10.94	11.71	28.14	34.84	23.52	57.07	37.80	37.38	32.55
Louisiana	6.33	11.49	9.05	26.87	36.61	16.78	57.20	34.45	33.52	27.59
Oklahoma	6.41	14.52	6.03	26.96	36.25	18.96	59.44	35.64	25.20	25.98
Texas	6.31	12.50	6.67	25.48	39.46	21.29	59.22	34.87	31.31	28.37
West South Central	6.10	12.01	8.56	26.67	36.89	20.37	57.24	35.04	32.64	29.58
Montana	9.38	21.23	0.99	31.60	29.17	47.33	60.60	43.18	40.70	39.47
Idaho	10.33	13.64	2.00	25.97	28.91	34.31	61.39	44.66	33.37	32.78
Wyoming	11.22	24.55	1.85	37.62	37.49	44.44	0	35.62	41.91	40.90
Colorado	11.11	22.37	3.61	37.09	46.26	44.41	59.15	13.82	43.91	41.75
New Mexico	11.46	15.00	2.28	28.74	56.18	32.77	0	35.91	40.05	38.96
Arizona	12.05	15.10	2.92	30.07	34.46	35.90	50.36	35.21	34.84	34.08
Utah	8.28	15.74	2.95	26.97	29.62	33.71	60.50	33.32	31.44	30.87
Nevada	7.79	12.48	4.24	24.51	23.53	36.59	60.50	33.25	30.93	29.29
Mountain	11.03	17.68	2.80	31.51	34.14	38.48	54.34	37.26	36.12	35.40
Washington	6.87	13.31	10.76	30.94	36.64	31.48	58.87	36.35	36.31	35.28
Oregon	9.19	15.39	9.59	34.17	28.37	24.49	59.97	37.80	30.25	30.90
California	10.78	9.96	5.56	26.30	30.51	26.69	52.51	12.87	23.14	23.78
Pacific	10.23	10.76	6.45	27.44	31.15	27.18	55.37	15.41	25.34	25.76
Continental U. S.	4.88	11.70	10.26	26.84	31.05	15.69	53.80	17.32	25.95	26.57
Hawaii	10.44	8.91	15.78	35.13	25.52	18.47	59.28	48.59	32.20	33.44
Puerto Rico	12.02	5.19	9.71	26.92	20.80	23.22	58.68	21.98	20.99	25.88
Alaska ⁵										
Territories	11.69	5.97	10.98	28.64	23.36	18.73	59.27	45.29	28.05	28.45
U. S. Average:										
1953-54	5.01	11.59	10.27	26.87	30.81	15.70	54.01	17.53	25.99	26.61
1952-53	4.63	11.34	9.87 ⁶	25.84 ⁶	28.54	14.48	51.89	21.96	23.24	25.05 ⁶
1951-52	4.30	11.14	9.42	24.86	27.96	14.71	49.98	20.97	22.16	24.04

¹ Excludes materials not guaranteed to contain N, P₂O₅, or K₂O.

² Guaranteed to contain two or more of the primary plant nutrients, N, P₂O₅, or K₂O.

³ Guaranteed to contain only one of the primary plant nutrients.

⁴ Includes the available P₂O₅ content of colloidal phosphate and phosphate rock as 2 percent and 3 percent, respectively.

⁵ Not available.

⁶ Revised.

cent) less than in 1952-53. The consumption of all fertilizers (materials and mixtures) containing primary nutrients was 1.67 percent below the 1952-53 level, whereas the total quantity of primary nutrients supplied by these fertilizers increased 4.42 percent.

The percentage change in consumption of primary nutrients in 1953-54 as compared with 1952-53 is shown by States and other political units in Figure 2. Percentage increases in nitrogen were generally highest in the West North Central and the West South Central States. These regions consumed 17.72 per-

cent of the total primary nutrients in mixed fertilizers and 28.98 percent of the total in materials (Table 6a). The percentage change in nitrogen consumption ranged from a decrease

of 13.08 percent in Maine to an increase of 117.18 percent in South Dakota. Wide variations are also shown in the percentage changes in the consumption of P_2O_5 and K_2O .

Table 6a.—Regional Distribution of Consumption of Primary Nutrients, as Percentages of Respective Totals in Mixtures and Materials, Year Ended June 30, 1954.

Region	N		Available P_2O_5		K_2O	
	Mixtures	Materials	Mixtures	Materials	Mixtures	Materials
New England	2.75	0.36	2.01	1.45	2.57	0.95
Middle Atlantic	11.75	1.76	11.64	5.51	11.31	1.48
South Atlantic	27.32	15.87	26.13	4.74	26.95	15.65
East No. Cent.	20.04	9.78	27.25	12.74	32.50	35.63
West No. Cent.	12.13	16.05	13.26	22.60	8.59	8.26
East So. Cent.	11.78	16.08	11.83	13.46	11.11	17.41
West So. Cent.	5.59	12.93	4.76	13.43	3.82	11.43
Mountain	0.80	5.53	0.55	11.17	0.10	0.27
Pacific	3.59	19.35	1.63	14.16	1.10	4.97
Territories	4.25	2.29	0.94	0.74	1.95	3.95
United States	100.00	100.00	100.00	100.00	100.00	100.00

USDA REPORTS

Fertilizer Situation for 1955-56

prepared by

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Commodity Stabilization Service

Food & Materials Requirements Division

USDA

Washington, D. C.

September 1955

The 1955-56 Fertilizer Outlook

On the basis of present information it is estimated that supplies of the three principal nutrients in 1955-56 will exceed the 1954-55 supply by about 2.5 percent. The estimate of larger supplies is based on existing rates of production and trends in usage and foreign trade rather than on capacity to produce fertilizer. Additional quantities of any one or all of the three nutrients can be produced should demand increase.

The available supply of plant nutrients has increased each year since the 1938-39 season, and the trend continues upward. Deliveries of nutrients to the fertilizer manufacturing industry during the 1954-55 season totaled 6.427 million tons, as compared with 6.215 million tons in 1953-54, or an increase of 3.4 percent.

Nitrogen

It is currently estimated that the 1955-56 supply of nitrogen available for fertilizer use will approximate 2.35 million tons. This preliminary estimate, based on current rate of production and trends in usage and foreign trade, represents an increase of 4.4 percent over the 2.25 million tons reported for 1954-55.

Details of the 1954-55 deliveries and the estimated 1955-56 supply of

nitrogen by type and class are shown in tables 1 and 1A.

Four companies sold urea for agricultural use in substantial amounts during the past season and therefore the nitrogen content is entered separately in the tables for the first time.

Losses in the net supply of nitrogen for agriculture occur in distribution and handling, the ammoniation of superphosphate, sales for small-scale industrial uses, and the consumption of ammonia in the manufacture of sulfuric acid in fertilizer plants. These come out of the shipments from primary producers to the fertilizer trade. Normally these losses amount to 2 to 3 percent.

Quantities of nitrogen that constitute the normal working stock in the hands of fertilizer manufacturers and ammonia distributors are not known precisely, but reports from the industry indicate that stocks are definitely larger than a year ago. New storage capacity, especially in the form of ammonia tanks, has contributed to this increase.

Phosphates

The 1955-56 supply of available phosphoric oxide is forecast at 2.3 million tons, or approximately the same quantity delivered in 1954-55.

This estimate is based on production, trends in consumption and foreign trade in recent years. Much larger supplies can be produced in 1955-56, provided the extra demand does not occur during the spring rush.

Details of the 1954-55 deliveries and the 1955-56 supply by type and class of material are shown in tables 2 and 2A.

Quantities of available P_2O_5 produced are always substantially more than the amounts delivered to farmers. An average of about 2 percent of the available P_2O_5 is reverted to an unavailable form in liming superphosphate for sale in bags. It has been estimated that an average of around 4 percent of the available P_2O_5 in run-of-pile goods used in making mixed fertilizers is also lost, mostly due to ammoniation.

Potash

The 1955-56 supply of potash available for fertilizer in terms of potassium oxide (K_2O) is estimated at 1.94 million tons. This represents an increase of approximately 4.3 percent over the 1.86 million tons available in 1954-55. This forecast is based on trends in production, use, and foreign trade rather than the capacity of the industry to produce. Details of the 1954-55 deliveries and the 1955-56 forecast are given in tables 3 and 3A.

GENERAL

Seasonal Demand

Heavy buying of fertilizer immediately prior to application adds to the expense of manufacture, compli-

Table 1.—NITROGEN: 1954-55 Supply for Fertilizer Purposes
United States and possessions (Trade delivery basis)¹
(In tons of 2,000 pounds nitrogen content)

Item	Ammonium Nitrate ²	Ammonium Sulfate & Sulfate-nitrate	Urea	Other Solids ³	Natural Organics	Compound solutions		Ammonia ⁴		Totals
						Ammonia-tion	Direct Application	Ammonia-tion	Direct Application	
U. S. Deliveries										
Synthetic	408,000	181,000	38,000	90,000	.....	453,000	35,000	170,000	414,000	1,789,000
By-product	.....	176,000 ⁵	.....	.....	30,000	.....	.....	2,000	360	178,000
Natural organics	.....	.....	.....	.....	.....	.....	.....	.....	.....	30,000
Total	408,000	357,000	38,000	90,000	30,000	453,000	35,000	172,000	414,300	1,997,300
Exports ⁶	11,000	90,000	4,000	12,000	1,000	30,000	.....	7,000	.....	153,000
Deliveries minus exports	397,000	267,000	34,000	78,000	29,000	423,000	35,000	165,000	414,300	1,842,300
Imports ⁶	133,000	57,000	34,000	174,000	7,000	.....	.....	3,000	.....	408,000
Net supply	530,000	324,000	68,000	252,000	36,000	423,000	35,000	168,000	414,300	2,250,300

¹ Based upon special reports from synthetic ammonia producers and other sources; Bureau of Mines' Monthly Coke Reports, and Bureau of the Census' Facts for Industry and Import and export reports.

² Includes mixtures of ammonium nitrate and limestone.

³ Includes ammonium phosphates, sodium nitrate, calcium nitrate, cyanamid, and nitraphosphates.

⁴ Includes aqua ammonia.

⁵ Includes nitrogen content of ammonium phosphate made from by-product ammonia.

⁶ Includes estimated nitrogen content of imported and exported mixed fertilizers and ammoniated superphosphate.

Table 1A.—NITROGEN: Estimated 1955-56 Fertilizer Supply¹
United States and possessions
(In tons of 2,000 pounds nitrogen content)

Item	Ammonium Nitrate ²	Ammonium Sulfate & Sulfate-nitrate	Urea	Other Solids ³	Natural Organics	Compound solutions ⁴		Ammonia ⁵		Totals
						For mixing	Direct Application	For mixing	Direct Application	
U. S. Production										
Synthetic	420,000	220,000	50,000	100,000	.....	470,000	50,000	180,000	460,000	1,930,000
By-Product	.....	185,000 ⁶	.....	.....	30,000	.....	.....	2,000	.....	187,000
Natural organics	.....	.....	.....	.....	.....	.....	.....	.....	.....	30,000
Total	420,000	405,000	50,000	100,000	30,000	470,000	50,000	182,000	460,000	2,167,000
Exports ⁷	15,000	110,000	5,000	20,000	1,000	40,000	.....	7,000	.....	198,000
Supply from domestic sources	405,000	295,000	45,000	80,000	29,000	430,000	50,000	175,000	460,000	1,969,000
Imports ⁷	120,000	50,000	30,000	170,000	6,000	.....	.....	5,000	.....	381,000
Net supply	525,000	345,000	75,000	250,000	35,000	430,000	50,000	180,000	460,000	2,350,000

¹ Based on present rates of production, imports and exports and trends in the trade.

² Includes mixtures with limestone.

³ Ammonium phosphates, sodium nitrate, calcium nitrate, cyanamid and nitraphosphates.

⁴ Includes ammonia-ammonium nitrate, ammonium nitrate and ammonia-urea solutions in water.

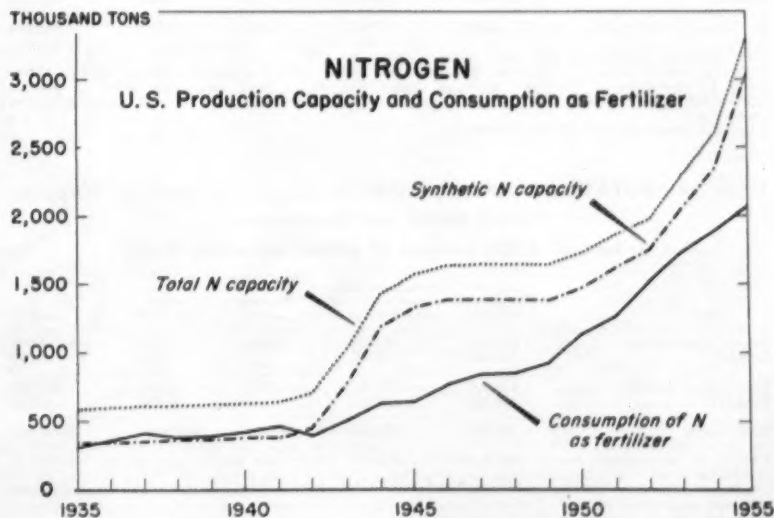
⁵ Includes aqua ammonia.

⁶ Includes by-product ammonium phosphate.

⁷ Includes estimated nitrogen content of imported and exported mixed fertilizers and ammoniated superphosphate.

cates transportation and delivery, and occasionally results in temporary shortages that disrupt growers' planting schedules. Delivery some time in advance of actual application, although advantageous to the manufacturer, as a rule makes some extra handling for the grower. However, the present trend is toward buying close to the time of application.

Fertilizer demand in 1941 rose to a peak of 27 percent of the year's total usage in the single month of March, as judged by tax tag sales. Another 28 percent of the year's total was taken in April. Thus more than half of the total for the year apparently was bought in two months. This is typical of pre-World War II practice. From 1942 to 1948 more farmers bought fertilizer in advance of need



because of shortages of nitrogen and potash. Since 1948 monthly purchases of tax tags indicate a growing tendency to return to the earlier buying practice.

Experiments have shown that application of fertilizer in late fall for

certain spring-planted crops is practical in some areas, especially in the North Central States. This would save time during the spring rush. However, fall application of nitrogen is not generally practical where the soil warms up during the winter.

Table 2.—PHOSPHORUS: 1954-55 Supply for Fertilizer Purposes
United States and Possessions (trade delivery basis)
(In tons of 2,000 pounds available phosphoric oxide (P₂O₅))

Item	Normal superphosphate	Enriched superphosphate	Concentrated superphosphate	All others ²	Total
U. S. Production	1,572,000	41,000	619,000	179,000	2,411,000
Exports ³	80,000	.....	59,000	30,000	169,000
Supply from U. S. sources	1,492,000	41,000	560,000	149,000	2,242,000
Imports ³	2,000	.....	1,000	67,000	70,000
Net supply	1,494,000	41,000	561,000	216,000	2,312,000

¹ Includes wet-mixed base goods.

² Includes ammonium phosphates, basic slag, fused rock phosphate, liquid phosphoric acid, and natural organics, and 2% of colloidal phosphate and 3% of rock phosphate applied directly to soil.

³ Includes the available P₂O₅ content of mixed fertilizers.

Table 2A.—PHOSPHORUS: Estimated 1955-56 Supply for Fertilizer Purposes
United States and Possessions
(In tons of 2,000 pounds available phosphoric oxide (P₂O₅))

Item	Normal superphosphate	Enriched superphosphate	Concentrated superphosphate	All others ²	Total
U. S. Production	1,550,000	45,000	650,000	200,000	2,445,000
Exports ³	100,000	.....	70,000	40,000	210,000
Supply from domestic sources	1,450,000	45,000	580,000	160,000	2,235,000
Imports ³	2,000	.....	1,000	62,000	65,000
Total supply	1,452,000	45,000	581,000	222,000	2,300,000

¹ Includes wet-mixed base goods.

² Includes ammonium phosphate, basic slag, fused rock phosphate, liquid phosphoric acid, dicalcium phosphate, high-grade residue, natural organics and other sources of available P₂O₅.

³ Includes the P₂O₅ content of mixed fertilizers and ammoniated superphosphate.

Table 3.—POTASSIUM: 1954-55 Supply for Fertilizer Purposes
United States and Possessions (trade delivery basis)
(In tons of 2,000 pounds of potassium oxide (K₂O))

Item	Potassium chloride ¹	Potassium sulfate and sulfate of potash-magnesia ¹	Manure salts ¹	All other materials ²	Total
Deliveries from domestic sources	1,687,000	107,000	1,000	26,000	1,821,000
Exports ³	86,000	10,000	.....	1,000	97,000
Deliveries minus exports	1,601,000	97,000	1,000	25,000	1,724,000
Imports ³	104,000	30,000	.....	7,000	141,000
Net supply for agriculture	1,705,000	127,000	1,000	32,000	1,865,000

¹ Deliveries as reported by producers.

² Includes potash content of imported potassium nitrate, of natural organics, such as tobacco stems, and of miscellaneous fertilizers, such as cement flue dust. Some small-scale sales of muriate (chloride) are included here since they are not included in the muriate data published elsewhere.

³ Includes potash content of mixed fertilizers.

Table 3A.—POTASSIUM: Estimated 1955-56 Supply¹ for Fertilizer Purposes
United States and Possessions
(In tons of 2,000 pounds of potassium oxide (K₂O))

Item	Potassium chloride	Potassium sulfate and sulfate of potash-magnesia	Manure salts	All other materials ²	Total
Domestic production	1,780,000	140,000	1,000	26,000	1,947,000
Exports ³	130,000	15,000	.....	1,000	146,000
Supply from domestic sources	1,650,000	125,000	1,000	25,000	1,801,000
Imports ³	100,000	30,000	.....	8,000	138,000
Total supply	1,750,000	155,000	1,000	33,000	1,939,000

¹ Based on consumption trends and prospective demand rather than on capacity of the industry to produce.

² Includes potassium nitrate, potassium carbonate, cement-flue dust, nitrate of soda-potash and natural organics.

³ Includes potash content of mixed fertilizers.

Prices

Wholesale prices of most nitrogenous fertilizers are slightly lower than they were a year ago, but phosphate and potash prices are about the same. The wholesale price of urea dropped substantially during the past year.

The average retail price of all mixed fertilizers sold in the United States in the 1953-54 season, as published in the September 15, 1954 issue of "Agricultural Prices," weighted by the tonnage of each grade sold, as reported by the Soil and Water Conservation Research Branch, is \$54.82 per ton. Similar weighted averages of chemical nitrogenous materials, natural organics, phosphates, and potash materials sold separately are \$88.26, \$54.12, \$40.49 and \$54.25 respectively. In the 1954-55 season retail prices of mixed fertilizers and potash materials averaged about \$1 per ton less, of nitrogenous materials about \$2 per ton less, and of phosphates, no change.

Status of Nitrogen Expansion

Details of the nitrogen production capacity of the country, by regions, for the years 1954 through 1957 and consumption figures for the years ended June 30, 1953 and 1954 are given in table 4. Proposed plants with a combined capacity of 220,000 tons of nitrogen have been left out of the 1957 total because of some doubt that they will be built.

Estimates of Canadian nitrogen production capacity are included in table 4 due to the fact that a large part of the Canadian production in the past has been used in the United States, and because capacity is being expanded in Canada also. If announced plans are carried out Canadian capacity will increase from around 300,000 tons on July 1, 1954 to about 500,000 tons of nitrogen in 1957.

Prior to 1942 consumption of nitrogen as fertilizer in the United States never exceeded a half-million tons. As shown by the graph, page 13, usage has increased rapidly since then.

Although every synthetic ammonia plant in the United States was operating at near capacity in 1951, with the exception of Morgantown Ordnance Works, demand for nitrogen was met only because of decreased exports and increased imports. The manner in which the import-export balance suddenly changed from 1950 to 1951 is shown in table 5. This trend continued until

1953, but has now swung in the other direction. In 1952 about 95 percent of total capacity was fully utilized to produce nitrogenous materials. In the 1954-55 fiscal year the rate of production had dropped to about 82 percent of capacity.

If demand for nitrogen should continue to grow at the rate it has in recent years, agriculture would require about 3,000,000 tons in 1959-60.

It appears now that agricultural consumption in 1954-55 approximated 2 million tons of nitrogen. Should requirements continue to increase 10 percent per year, as they did for a number of years, ample production capacity will be available in North America by July 1, 1956 to take care of this and all other normal needs of this continent for the next few years.

Status of Phosphorus Expansion

Because the heaviest demand for superphosphates occurs during a brief period prior to application, the lack of suitable storage space limits the operation of producing plants the rest of the year. This situation affects the estimation of plant capacity. However, it can be stated that production capacities have increased from January 1, 1952 to July 1, 1955 as follows: normal superphosphate 4 percent, concentrated superphosphate 187 percent, and miscellaneous phosphates 52 percent.

Miscellaneous phosphates include basic slag, ammonium phosphates, nitrates, phosphates, fertilizer-grade bone meal and a number of other materials of lesser importance.

During the coming year about 250,000 tons of additional P_2O_5 capacity

is expected to come into production. A considerable part of this will be in the form of ammonium phosphates.

Status of Potash Expansion

Estimated production capacity of refined salts was 1,400,000 tons of K_2O on January 1, 1951. Capacity on July 1, 1955 was estimated to be 2,100,000 tons. Plans to erect 400,000 tons of additional K_2O capacity have been announced for early completion. Facilities to produce 40,000 tons of additional potassium sulfate came into use during the past spring.

Most of the large potash producers have acquired rights to mine potash in the Province of Saskatchewan, Canada. One company is sinking a shaft to the potash beds. Commer-

cially exploitable potash beds are reported to have been found in Grand Canyon, Utah.

Miscellaneous Developments

The use of fertilizer-insecticide mixtures in agriculture increased from 10,000 tons in 1950-51 to 87,000 in 1952-53, 149,000 in 1953-54 and around 200,000 tons in 1954-55.

Use of liquid fertilizers for most purposes has been handicapped by lack of an inexpensive implement that would make satisfactory application. An improved hose-pump distributor attachment for tractor or other machinery has been developed for this purpose in cooperation with the Department of Agriculture. Commercial manufacture of this attachment began during the past year.

Table 4.—NITROGEN: Production capacity and consumption as fertilizer (1,000 tons—2,000 pounds each—of nitrogen content)

Region	Production capacity ¹ as of July 1				Fertilizer consumption ² year ended June 30	
	1954	1955	1956	1957	1953	1954
Eastern ³	791	898	1,062	1,097	492	518
East North Central ⁴	380	472	652	653	239	261
West North Central ⁵	188	301	359	452	180	266
East South Central ⁶	250	372	408	500	256	363
West South Central ⁷	789	949	949	950	151	182
Western ⁸	210	297	485	680	266	299
Territories ⁹	1	1	1	35	53	58
Total United States	2,609	3,290	3,916	4,367	1,637	1,847
Eastern Canada ¹⁰	139	162	204	290	29	30
Western Canada ¹¹	167	177	190	219	15	12
GRAND TOTAL	2,915	3,629	4,310	4,876	1,681	1,889

¹ Estimated total of synthetic, chemical by-product and natural organic nitrogen.

² U. S. figures from data compiled by the Soil and Water Conservation Research Branch, Department of Agriculture; those for Canada from Dominion Bureau of Statistics.

³ New England, Middle Atlantic and South Atlantic States.

⁴ Ohio to Wisconsin inclusive.

⁵ North Dakota and Minnesota to Kansas and Missouri inclusive.

⁶ Kentucky and Alabama to Mississippi inclusive.

⁷ Oklahoma, Arkansas, Louisiana and Texas.

⁸ Montana and New Mexico to Washington and California inclusive.

⁹ Alaska, Hawaii and Puerto Rico.

¹⁰ Newfoundland to Ontario inclusive.

¹¹ Manitoba to British Columbia inclusive.

Table 5.—U. S. Nitrogen Balance Sheet (In tons of 2,000 pounds nitrogen content)

Item	Year ended					
	Dec. 30, 1950	Dec. 30, 1951	Dec. 30, 1952	Dec. 30, 1953	June 30, 1954	June 30, 1955
Production:						
Synthetic ¹	1,288,463	1,453,711	1,668,069	1,882,847	2,074,882	2,481,436
By-product ²	192,099	207,313	184,286	216,298	202,141	201,012
Natural organic ³	38,000	37,000	36,000	35,000	35,000	30,000
Total	1,518,562	1,698,024	1,908,355	2,134,145	2,312,023	2,712,488
Conversion loss (5% of synthetic production)	64,423	72,686	84,403	94,142	103,744	124,072
Deduction for increase in stocks at producing plants during the season ⁴	.....	6,278	16,319	43,274	13,802	55,170
Exports (industrial and fertilizer) and re-exports	245,382	79,461	69,022	44,478	87,000	196,000
Domestic current supply apparently consumed	1,208,757	1,539,599	1,738,611	1,952,251	2,107,477	2,337,206
Addition for decrease in stocks at producing plants during the season ⁵	4,157	.....	.....	.....	.....	.....
Imports (industrial and fertilizer)	276,697	357,110	471,142	501,151	438,000	419,000
Total apparent consumption	1,489,611	1,896,709	2,209,753	2,453,402	2,545,477	2,756,206
Consumption as fertilizer	1,126,000	1,265,900	1,505,000	1,709,000	1,847,416	2,000,000
Apparent consumption for all other uses ⁶	363,611	630,809	704,753	744,402	698,061	756,206

¹ Computed from anhydrous ammonia production reported by U. S. Bureau of the Census' Facts for Industry.

² Computed from ammonium sulfate and aqua ammonia production reported by U. S. Bureau of Mines.

³ Estimated quantity available for fertilizer.

⁴ Stocks of anhydrous ammonia, synthetic and by-product ammonium sulfate, by-product aqua ammonia, nitric acid and ammonium nitrate. (Partly from U. S. Bureau of the Census' Facts for Industry and Inorganic Chemicals and partly from unpublished data.)

⁵ This figure is merely the difference between the two numbers above it. Although of the correct order of magnitude, it is less accurate than the other data because stock-buildup in the hands of industrial users, fertilizer mixer and distributors is not evaluated.

nitric acid
HIGH PRESSURE PROCESS

ammonium nitrate
STENGEL PROCESS — AMMONIATED SOLUTIONS
PRILLING



complex fertilizer
PEC PROCESS (NITRIC PHOSPHATE — AMMONIUM PHOSPHATE)



THE CHEMICAL AND INDUSTRIAL CORP. • CINCINNATI 26, OHIO

Fertilizer Consumption Sets **ANOTHER RECORD** in 1954

Use of all fertilizers by American farmers was 1.4 percent greater in the 1954 calendar year than during the previous 12 months.

Fertilizer consumption in the United States inched upward to a record 20,508,000 tons in the 1954 calendar year. This is an increase of 277,000 tons, or 1.4 percent, over the 20,231,000 tons of commercial fertilizer used during the previous year, according to a study of consumption for the 12-month period ending December 31, 1954 made by **Plant Food Review**.

This study is based on preliminary although authoritative estimates and therefore is subject later to some minor adjustments.

Calendar 1954 was the 16th consecutive year that fertilizer consumption pushed to a new high. This unbroken record of annual increases began in 1938 when fertilizer use was 7,548,000 tons. During this 16-year period, fertilizer consumption has almost tripled.

Plant food content of fertilizer also continues upward. There is every indication that the average N-P₂O₅-K₂O content of all fertilizers, mixed goods plus straight materials for direct application, has climbed to at least 26.6 percent. This means that about 5,435,000 tons of plant food nutrients were applied to the Nation's soils during the past calendar year. This is 377,000 tons, or a whopping 7.3 percent more than the 5,058,000 tons of plant food in all commercial fertilizer used in 1953.

The Corn Belt States are using an increasingly greater proportion of total U. S. fertilizer consumption in comparison with other regions. (See Table I.) In 1945, the year World War II ended, the East and West North Central States accounted for only 19.5 percent of total U. S. consumption. The South Atlantic States used 40.6 percent of the total that year.

In the 10-year period since 1945, fertilizer use in the South Atlantic States increased tonnage-wise by

by John F. Gale
in *Plant Food Review*
Published by
The National Plant Food Institute

more than 1.2 million tons, but dropped percentage-wise to 32.1 percent of the U. S. total. Middle Western farmers meanwhile were rapidly boosting fertilizer use so that in 1954 they accounted for 29.9 percent of the total and nearly as much tonnage as was used by South Atlantic farmers.

Only in the New England States has consumption decreased in the post-war years. In all other areas, farmers are using far more fertilizer than they did 10 years ago. For the U. S. as a whole, consumption has zoomed upward from 13,201,703 tons in 1945 to 20,507,714 tons in 1954—a resounding 55.2 percent increase.

North Carolina, which historically has been the leading State in fertilizer consumption, again led all the States last year with 1,824,352 tons. Next in line, tonnage-wise, was Georgia with 1,372,284 followed by Florida's 1,257,943 tons.

Alabama recorded the greatest increase for a single State—a jump of 156,128 tons over its 1953 consumption.

Percentage-wise, South Dakota made the greatest gain. Farmers in this State used 31,381 tons of fertilizer in 1954, 11,473 tons more than during 1953—a 57.6 percent increase.

This is how the various regions stacked up tonnage-wise in 1954 as compared with 1953:

South Central	+ 279,156
West North Central	+ 248,626
Western	+ 43,312
New England	— 45,745
Middle Atlantic	— 57,300
East North Central	— 74,653
South Atlantic	— 116,463
United States	+ 276,933

The 10 leading States consumed well over half—55 percent—of all the fertilizer used in the U. S. in 1954. The States and their 1954 tonnages were:

North Carolina	1,824,352
Georgia	1,372,284
Florida	1,257,943
Alabama	1,196,623
Indiana	1,161,909
Ohio	1,008,400
Illinois	897,322
South Carolina	886,654
California	831,570
Virginia	776,786
TOTAL	11,213,848

Direct Government distribution of fertilizer for use in the Agricultural Conservation Program was at a low point last year. The U. S. Department of Agriculture made direct purchases of only 19,355 tons of which 2,556 tons went to farmers in Maine and 16,799 tons were distributed in Vermont. Similar purchases in 1953 totalled some 50,000 tons for distribution in 7 States.

For use in its test and demonstration program, Tennessee Valley Authority shipped 18,011 tons during the 12 months from July 1, 1953 through June 30, 1954. This is 2,500 tons less than shipments during the preceding fiscal year.

Figures used in this report are for the calendar year from January 1, 1954 through December 31, 1954. The official U. S. Department of Agriculture fertilizer consumption report issued late in May is for the fiscal year ending June 30, 1954.

Our report also differs from the USDA report in that tonnages of certain materials are not included to

**U. S. FERTILIZER CONSUMPTION BY REGIONS—1954
WITH COMPARISONS
(Short Tons)**

REGION	1945 Consump- tion (Tons)	Percent of Total 1945	1953 Consump- tion (Tons)	Percent of Total 1953	1954 Consump- tion (Tons)	Percent of Total 1954	Percent Increase or Decrease 1954 over 1945
New England	500,190	3.8	469,153	2.3	423,403	2.1	-15.4
Middle Atlantic	1,242,521	9.4	1,497,597	7.4	1,440,297	7.0	15.9
East North Central	2,081,813	15.8	4,140,033	20.4	4,065,380	19.8	95.3
West North Central	490,584	3.7	1,821,747	9.0	2,070,373	10.1	322.0
South Atlantic	5,365,945	40.6	6,709,887	33.1	6,593,424	32.1	22.4
South Central	2,813,568	21.3	4,307,001	21.0	4,486,157	21.9	59.4
Western	707,082	5.4	1,385,363	6.8	1,428,675	7.0	102.1
United States	13,201,703	100.0	20,230,781	100.0	20,507,714	100.0	55.2

FERTILIZER CONSUMPTION IN THE UNITED STATES

(Short Tons)

STATE	TOTAL CONSUMPTION					1954		
	1944	1950	1951	1952	1953	TOTAL CON-SUMPTION	COM-MERCIAL SALES	TVA TEST & DEM. PROGRAM
NEW ENGLAND	459,689	474,486	459,007	474,788	469,153	422,408	423,408	0
Maine	226,873	200,069	172,219	216,917	211,287	178,751	178,751	0
New Hampshire	21,272	27,879	23,280	16,589	20,291	16,274	16,274	0
Vermont	38,218	50,722	66,164	46,166	50,582	40,368	40,368	0
Massachusetts	89,628	88,334	86,620	95,448	85,454	85,917	85,917	0
Rhode Island	15,330	16,402	17,419	16,309	14,299	14,132	14,132	0
Connecticut	74,365	91,080	92,305	83,339	87,240	87,966	87,966	0
MIDDLE ATLANTIC	1,208,969	1,445,203	1,486,299	1,514,182	1,497,597	1,440,297	1,440,297	0
New York	478,669	609,500	625,080	631,250	640,000	588,800	588,800	0
New Jersey	239,687	249,347	246,710	270,505	252,984	265,550	265,550	0
Pennsylvania	487,613	586,356	614,589	612,427	604,693	585,947	585,947	0
EAST NORTH CENTRAL	1,769,693	3,212,358	3,288,970	3,914,399	4,140,033	4,065,380	4,064,402	978
Ohio	890,672	924,727	930,463	1,113,968	1,107,895	1,008,400	1,008,292	108
Indiana	478,814	921,680	891,435	1,049,415	1,106,722	1,161,909	1,161,599	310
Illinois	195,670	474,234	646,668	792,162	919,638	897,322	896,821	501
Michigan	287,858	506,743	540,901	601,205	598,532	575,481	575,481	0
Wisconsin	216,679	384,974	379,303	337,649	407,246	422,268	422,209	59
WEST NORTH CENTRAL	404,357	1,117,843	1,330,295	1,570,818	1,821,747R	2,070,373	2,069,880	493
Minnesota	77,516	217,133	200,936	212,701	279,229	313,238	313,238	0
Iowa	94,696	314,037	296,263	402,613	579,327	609,868	609,804	64
Missouri	179,716	365,672	465,219	570,886	562,928	649,750	649,627	123
North Dakota	3,050	20,173	30,880	34,128	41,158R	48,643	48,643	0
South Dakota	300	6,135	7,451	11,201	19,908	31,381	31,229	152
Nebraska	2,500	47,067	77,595	100,848	144,321	191,452	191,404	48
Kansas	46,579	147,626	161,651	238,441	194,676	226,041	225,935	106
SOUTH ATLANTIC	5,014,541	6,354,362	6,438,237	6,838,414	6,709,887R	6,593,424	6,589,492	3,932
Delaware	45,290	58,845	69,797	81,259	85,000	89,250	89,250	0
Maryland	216,425	252,644	272,292	286,687	295,104	309,639	309,639	0
District of Columbia	1,500	2,000	2,000	2,400	2,500	2,700	2,700	0
Virginia	563,122	767,932	807,359	845,721	799,548R	776,786	776,178	608*
West Virginia	59,428	104,467	103,027	96,334	84,168	73,816	73,816	0
North Carolina	1,406,828	1,818,921	1,766,479	1,872,685	1,820,622	1,824,352	1,822,947	1,405*
South Carolina	810,934	1,014,253	938,936	971,565	956,251	886,654	886,047	607
Georgia	1,080,812	1,237,932	1,273,136	1,393,985	1,386,162	1,372,284	1,370,972	1,312*
Florida	830,202	1,097,368	1,205,211	1,287,778	1,280,532	1,257,943	1,257,943	0
SOUTH CENTRAL	2,584,906	4,304,500	4,465,111	4,483,104	4,207,001R	4,486,157	4,473,915	12,242
Kentucky	308,688	620,938	559,274	599,643	549,692R	574,197	572,420	1,777*
Tennessee	342,590	502,722	608,969	595,078	563,334	580,206	573,139	7,067*
Alabama	823,189	1,054,734	1,094,648	1,115,893	1,040,500	1,196,628	1,194,231	2,397*
Mississippi	456,051	764,437	764,051	707,473	654,805	710,298	709,472	826*
Arkansas	171,848	366,184	415,091	365,528	398,063	374,601	374,601	0
Louisiana	233,561	278,708	302,633	335,805	292,907	328,814	328,814	0
Oklahoma	23,328	144,634	152,279	181,901	146,093	131,390	131,215	175
Texas	225,451	572,723	566,176	581,783	561,607	590,823	590,823	0
WESTERN	615,533	1,075,236	1,258,188	1,280,817	1,385,363R	1,428,675	1,428,309	366
Montana	7,300	16,000	18,000	20,000	26,000R	27,000	27,000	0
Idaho	25,342	65,050	60,000	50,000	74,000R	75,000	75,000	0
Wyoming	4,300	6,500	6,500	7,000	11,800R	12,000	12,000	0
Colorado	11,080	37,974	49,695	44,233	48,354	46,458	46,312	146
New Mexico	7,044	13,494	20,015	22,722	24,829	22,475	22,475	0
Arizona	21,600	76,000	106,960	109,234	116,047	135,481	135,481	0
Utah	12,320	28,554	30,053	35,513	32,430	22,379	22,306	73
Nevada	400	1,940	2,691	2,874	3,813	2,971	2,971	0
Washington	55,984	81,147	86,147	91,488	122,101	125,147	125,000	147
Oregon	41,955	107,931	100,350	119,695	122,999	128,194	128,194	0
California	428,306	640,646	777,777	788,058	803,000	831,570	831,570	0
UNITED STATES	12,054,688	17,983,988	18,826,107	20,076,522	20,230,781R	20,587,714	20,489,703	18,011

* States or areas included in Tennessee River Valley.
R Revised.

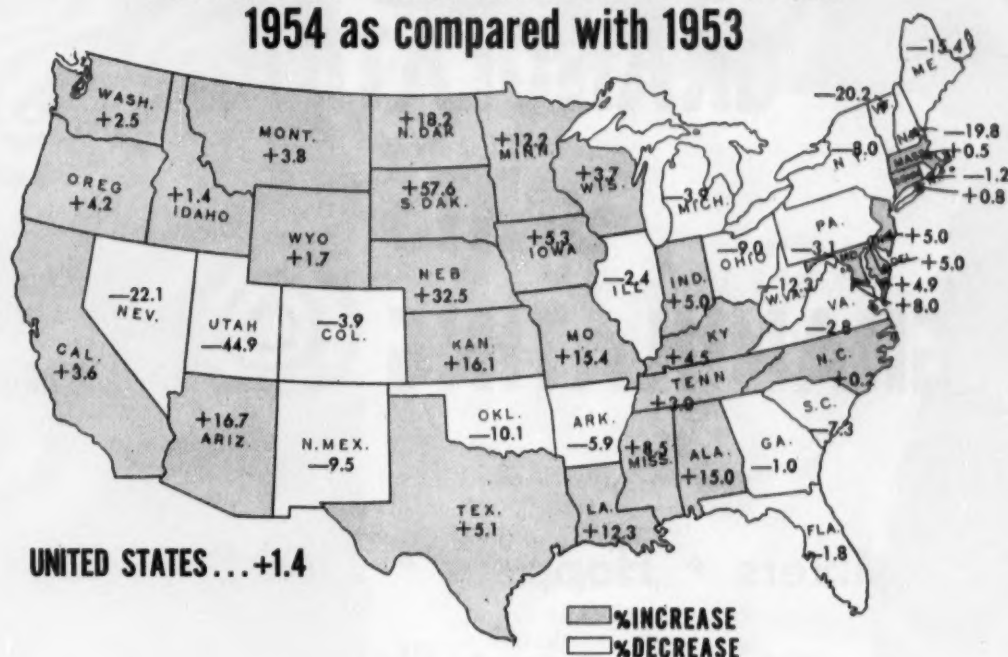
1 Includes 2,556 Tons ACP Distributed Fertilizer.
2 Includes 16,799 Tons ACP Distributed Fertilizer.

ANNUAL FERTILIZER CONSUMPTION IN THE UNITED STATES

(Short Tons)

YEAR	TONNAGE		YEAR	TONNAGE		YEAR	TONNAGE		YEAR	TONNAGE		TOTAL TONNAGE	COMMERCIAL SALES	GOVERNMENT DIRECT DISTRIBUTION
	1918	1919		1920	1921		1922	1923		1924	1925			
1880	1,150,000	1,150,000	1919	6,626,000	6,626,000	1931	6,354,000	6,354,000	1943	11,463,000	10,564,000	899,000		
1890	1,850,000	1,850,000	1920	7,177,000	7,177,000	1932	4,385,000	4,385,000	1944	12,055,000	11,202,000	853,000		
1900	2,300,000	2,300,000	1921	8,863,000	8,863,000	1933	4,908,000	4,908,000	1945	13,202,000	12,300,000	902,000		
1910	3,453,000	3,453,000	1922	5,671,000	5,671,000	1934	5,583,000	5,583,000	1946	14,892,000	14,512,000	380,000		
1911	6,024,000	6,024,000	1923	6,445,000	6,445,000	1935	6,276,000	6,276,000	1947	15,039,000	14,787,000	252,000		
1912	5,767,000	5,767,000	1924	6,826,000	6,826,000	1936	6,931,000	6,931,000	1948	15,980,000	15,773,000	207,000		
1913	6,337,000	6,337,000	1925	7,334,000	7,334,000	1937	8,226,000	8,226,000	1949	16,449,000	16,391,000	58,000		
1914	7,100,000	7,100,000	1926	7,329,000	7,329,000	1938	7,548,000	7,548,000	1950	17,984,000	17,871,000	113,000		
1915	5,324,000	5,324,000	1927	6,844,000	6,844,000	1939	7,707,000	7,707,000	1951	18,826,000	18,680,000	146,000		
1916	5,125,000	5,125,000	1928	7,986,000	7,986,000	1940	8,349,000	8,349,000	1952	20,076,522	19,993,522	83,000		
1917	5,926,000	5,926,000	1929	8,012,000	8,012,000	1941	9,183,000	9,183,000	1953	20,230,781	20,159,781	71,000		
1918	6,467,000	6,467,000	1930	8,222,000	8,222,000	1942	9,949,000	9,949,000	1954	20,507,714	20,470,348	37,000		

FERTILIZER CONSUMPTION BY STATES 1954 as compared with 1953



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the extent it has been possible to eliminate them from available information. Materials excluded are limestone, phosphate rock, colloidal phosphate, basic slag, secondary and

trace elements, gypsum, sulfur and other soil amendments. Consumption of these materials each year, not including limestone, may be as high as 2,000,000 tons.

The excellent cooperation of State fertilizer control officials, officials of State departments of agriculture, and industry representatives has made this report possible.



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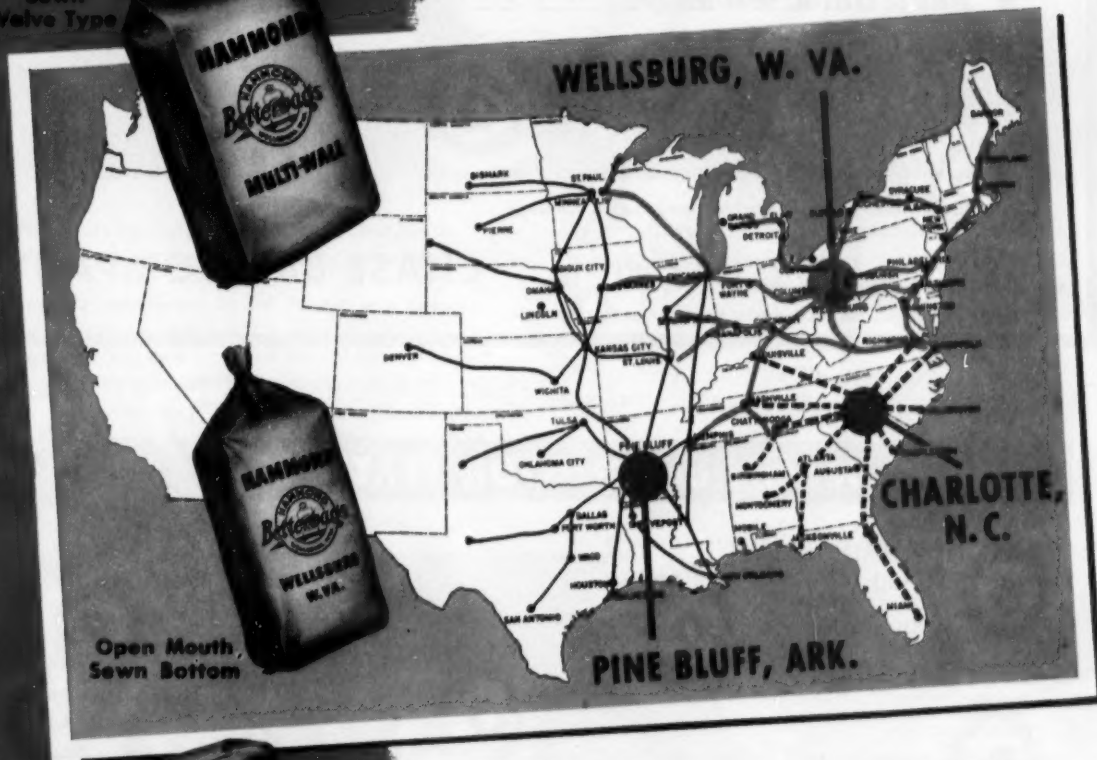
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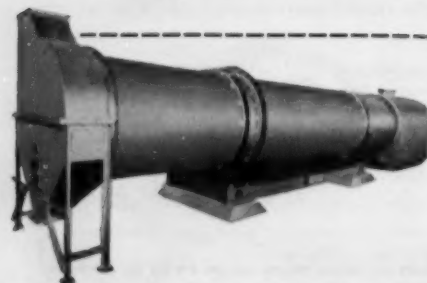
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... 39% Magnesium Carbonate

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"41 Years Service to the Fertilizer Industry in the Southeast"

SUMMARY OF STATE FERTILIZER CONTROL LAWS, REGULATIONS AND RULINGS

(In Effect July 1, 1955)

Prepared by National Plant Food Institute, Inc., Washington, D. C.

IMPORTANT

This summary does not include all provisions of the State Fertilizer Control Laws. It contains general requirements that are common to most such laws. Many State laws contain other provisions with which distributors must comply. Every manufacturer should obtain and familiarize himself with the complete law of each State in which he markets his products. A copy of the law and registration forms may be procured from the appropriate State Control official.

EXPLANATION OF NOTATIONS INDICATED IN SUMMARY

- (1) Effective January 1, 1956.
- (2) May also be paid by tag or stamp system.
- (3) Guarantee of potential acidity or basicity may be permitted or required.
- (4) Commercial fertilizer defined as containing 5 per cent or more available nitrogen, phosphorus pentoxide or potassium oxide singly, collectively or in combination.
- (5) See law for provisions.
- (6) Grades in approved list contain 20% or more plant food.
- (7) Potash derived from sulfate or carbonate forms may be claimed on label.
 - (a) Source: Sulfate or muriate must be indicated.
- (8) Unacidulated mineral phosphates and basic slag shall be guaranteed to:
 - (a) Both total and available P_2O_5 .
 - (b) Available P_2O_5 .
 - (c) Total P_2O_5 .
 - (d) Degree of fineness.
 - (e) Total P_2O_5 may be substituted for available P_2O_5 .
- (f) Per cent passing through 200 mesh screen.
- (g) Available P_2O_5 shall be stated as zero (0) if none is guaranteed.
- (h) Available P_2O_5 may be guaranteed if desired.
- (i) For basic slag either total or available P_2O_5 .
- (j) For rock phosphate, if total P_2O_5 is stated, percentage of insoluble P_2O_5 must also be given.
- (k) No untreated phosphate rock or other mineral phosphate containing less than 30 per cent may be sold.
- (l) For unacidulated mineral phosphates, both available and total P_2O_5 shall be guaranteed.
- (9) Bone, tankage, and other natural organic phosphates shall be guaranteed as to:
 - (a) Total P_2O_5 .
 - (b) In no case shall both total and available P_2O_5 content appear on same label.
 - (c) Available P_2O_5 may be guaranteed if desired.
 - (d) Degree of fineness may be stated.
 - (e) Total P_2O_5 may be substituted for available P_2O_5 .
- (10) Complete fertilizers containing 25 percent or more nitrogen in water-insoluble form of plant or animal origin may contain
 - (a) Minimum of 18 per cent primary plant food.
 - (b) Minimum of 24 per cent primary plant food.
 - (c) Minimum of 16 per cent primary plant food.
 - (d) Material below 18 per cent must be labeled "Non-Commercial less than 18% available plant food."
 - (e) Provided guarantee states total, organic, and water soluble forms of nitrogen.
- (11) Total and available P_2O_5 content may be on same analysis statement only in case of:
 - (a) Unacidulated mineral phosphate.
 - (b) Basic slag.
- (12) In bone meal, phosphate rock, and other products wherein the phosphoric acid is not readily available, the total P_2O_5 may be claimed, but tag shall state that such product is not a substitute for superphosphate nor designed to be used as such.

REGISTRATION

STATE	Annual or Permanent	Date of Renewal	Brand Fee	Approved Grade List	Minimum Plant Food Content	
					Mixtures	Superphosphate
Alabama	A	Oct. 1	\$5.00	Yes	16% (25)	16%
Arizona (1)	A	Jan. 1	\$5.00	No	12% (4)	Not stated
Arkansas	A	July 1	None	Yes	Not stated	Not stated
California	A	July 1	\$50.00	No	Not stated (4)	Not stated
Colorado	A	July 1	\$25.00 (39)	No	20% (10a, e)	18%
Connecticut	A	Jan. 1	\$10 per element	No	(20)	(20)
Delaware	A	Jan. 1	\$1.00	No	16%	Not stated
Florida	P	Jan. 1	None	No	16% (23)	Not stated
Georgia	A	Jan. 1	\$5.00	No	14%	16%
Idaho	A	Jan. 1	\$25.00	No	Not stated	Not stated
Illinois	A	Jan. 1	\$25.00	No	20%	Not stated
Indiana	A	July 1	\$5.00	No	Not stated	Not stated
Iowa	A	July 1	\$25.00 (36)	No	Not stated	Not stated
Kansas	A	July 1	\$5.00	No	Not stated	Not stated
Kentucky	A	Jan. 1	None	No	Not stated	Not stated
Louisiana	A	Sept. 1	None	Yes	20%	18%
	A	Jan. 1	\$14 for N and P_2O_5 ; \$7 for K ₂ O and Mg.	No	Not stated	Not stated
Maine						
Maryland	A	Jan. 1	\$10.00	No	Not stated	Not stated
Massachusetts	A	Jan. 1	\$8.00 per element	No	Not stated (19)	Not stated
Michigan	A	Jan. 1	\$20.00	No	Not stated	Not stated
Minnesota	A	July 1	\$1.00	Yes	27% (10b)	18%
Mississippi	A	Jan. 1	\$5.00	Yes	16%	18%
Missouri	A	July 1	None	No	Na	Na
Montana	A	Jan. 1	\$25.00	No	16%	16%
Nebraska	P	None	\$1.00	No	18% (10a, d)	18%
Nevada	A	July 1	\$25.00	No	Not stated (4)	Not stated
New Hampshire (1)	A	Jan. 1	\$10 per element. Not to exceed \$25 for brand.	No	20% (10c)	18%
New Jersey	A	July 1	\$0.50	No	Not stated	Not stated
New Mexico	A	Jan. 1	\$5.00	No	Not stated	Not stated
New York	A	Jan. 1	\$20.00	No	Not stated	Not stated
North Carolina	A	July 1	\$2.00	Yes	20% (10a), (15)	18%
North Dakota	A	July 1	\$5.00	No	20% (10a)	16%
Ohio	A	Jan. 1	\$50.00	No	18%	18%
Oklahoma	P	None	None	Yes	(6)	(6)
Oregon (1)	A	Jan. 1	\$25.00	No	(4)	Not stated
Pennsylvania	A	Jan. 1	(37)	No	16%	Not stated
Rhode Island	A	Jan. 1	\$10 per element	No	Not stated	Not stated
South Carolina	A	July 1	\$1.00	Yes	20% (10a)	18%
South Dakota	A	Jan. 1	\$1.00 (45)	Yes	20% (5), (10a)	18%
Tennessee	A	July 1	None	No	14%	16%
Texas	A	Sept. 1	None	Yes	(6)	(6)
Utah	A	Jan. 1	\$25.00	No	16%	Not stated
Vermont (1)	A	Jan. 1	\$20.00 (38)	No	Not stated	Not stated
Virginia	A	July 1	\$2.00	Yes	18% (5) (15)	18%
Washington	A	Jan. 1	\$25.00	Yes	20% (10a)	18%
West Virginia	P	None	\$1.00	Yes	20% (10a)	18%
Wisconsin	A	July 1	\$25.00	No	24%	18% (34)
Wyoming	A	Jan. 1	\$25.00	No	Not stated	Not stated

(13) Penalty is three times deficiency based on following tolerance scale:

Total Nitrogen		Available P_2O_5		Soluble K ₂ O	
Guarantee, %	Deficiency	Guarantee, %	Deficiency	Guarantee, %	Deficiency
2	0.20	Up to 10%	0.40	2	0.20
4	0.25	10-25	0.50	3	0.30
5-8	0.35	over 25	0.75	4	0.40
8-30	0.40			4-8	0.50
over 30	0.50			8-20	0.60
	0.75			over 20	1.00

(a) Penalty three times commercial value of nitrogen deficiency, four times the value of deficiencies of available P_2O_5 and soluble K₂O based on following scale:

Total Nitrogen		Available P_2O_5		Soluble K ₂ O	
Guarantee, %	Deficiency	Guarantee, %	Deficiency	Guarantee, %	Deficiency
3% or less	0.30	Up to 10%	0.40	3	0.30
4	0.35	10-25	0.50	4	0.40
4-8	0.40	over 25	0.75	4-8	0.50
8-30	0.50			8-20	0.60
over 30	0.75			over 20	0.75

STATE	GUARANTEED ANALYSIS						LABELING	
	Form of Nitrogen (N)	Form of Phosphate (P ₂ O ₅)	Form of Potash (K ₂ O)	Other Elements Covered	Potential Acidity or Basicity	Plant Food Source Statement	Tag Affixed to Bag	Printed on Bag
Alabama	Total, Organic, Inorganic N	Available	K ₂ O	Yes	Yes	Yes	Yes	Yes
Arizona (1)	Total N	Available (8)	Soluble	Not stated	No	On registration application only	Yes	Yes
Arkansas	Total	Available (9a)	Water Soluble	Not stated	No	On registration application only	Yes	Yes
California	Total (28a)	Available	Water Soluble	Yes	No	Yes	Yes	Yes
Colorado	Total	Available (8a, d), (9a)	Soluble	Yes	Yes	Yes	Yes	Yes
Connecticut	Total	Available (8a, d), (9a)	Soluble	Yes	N	No (7)	Yes	Yes
Delaware	Total	Available	Water Soluble	Not stated	No	No	Yes	Yes
Florida	(28)	Available and Insoluble	Water Soluble	Yes	No	On registration application and label	Yes	Yes
Georgia	Total (32)	Available (9a)	K ₂ O	Yes	No	On registration application and label (32)	Yes	Yes
Idaho	Available	Available	Water Soluble	Yes	No	On registration application and label	Yes	Yes
Illinois	Total	Available (8c, h), (9a, c)	Water Soluble (7)	Not stated	No	No	Yes	Yes
Indiana	Total	Available (8a, d), (9a)	Soluble	Yes	No	No	Yes	Yes
Iowa	Total	Available (8a, l), (9a)	Available	Not stated	No	No	Yes	Yes
Kansas	Total	Available (8a, d), (9a)	Water Soluble	Yes	No	No	Yes	Yes
Kentucky	(43)	(43)	(43) (7a)	(43)	No	On registration application and label	Yes	Yes
Louisiana	Total	Available (8c), (9a)	Soluble	Yes	No	On registration application only	Yes	Yes
Maine	Available	Available	Water Soluble	Yes (31)	No	No	Yes	Yes
Maryland	Total	Available (9a)	Water Soluble	Not stated	No	On registration application only (26)	Yes	Yes
Massachusetts	Total	Available (8c), (9a)	Water Soluble	Yes	No	No	Yes	Yes
Michigan	Available	Available and Total	Water Soluble	Yes	No	No	Yes	Yes
Minnesota	Total	Available (8b, d), (9a)	Soluble	Yes	(3)	On registration application only	Yes	Yes
Mississippi	Total	Available (12)	Potash	Not stated	Yes	For nitrogen only, on both tag and registration application	Yes	Yes
Missouri	Total	Available (8a, d), (9a)	Soluble	Yes	No	No	Yes	Yes
Montana	Total	Available and Total	Water Soluble	Not stated	No	On registration application and label	Not stated	Yes
Nebraska	Total	Available (8a, d), (9a)	Soluble	Yes	(3)	On registration application only	Yes	Yes
Nevada	Total	Available and Total (8a, d), (9a)	Soluble	Yes	(3)	On registration application and label	Yes	Yes
New Hampshire (1)	Total	Available (8a, d), (9a)	Soluble	Yes (42)	No	No	Yes	Yes
New Jersey	Total	Available (8a, d), (9a)	Soluble	Yes	(3)	No	Yes	Yes
New Mexico	Total	Total, insoluble, available	Water Soluble	Yes	No	(41)	Yes	Yes
New York	Total	Available (8a), (9a)	Water Soluble	Yes	Yes	No	Yes	Yes
North Carolina	Total (21), (24)	Available (11a, b)	Soluble or Available	Yes (5), (29)	Yes	On registration application only	Yes	Yes
North Dakota	Total	Available (8b, d), (9a)	Soluble	Yes	(3)	On registration application only	Yes	Yes
Ohio	Total	Available (8c, k), (9a)	Available	Not stated	No	No	Yes	Yes
Oklahoma	Total	Available	Water Soluble	(33)	No	No	Yes	Yes
Oregon (1)	Total	Available (9a, b)	Available	Yes	No	On registration application and label	Yes	Yes
Pennsylvania	Total	Available (8c), (9a)	Water Soluble	Not stated	No	No	Yes	Yes
Rhode Island	Total	Available (8c), (9a)	Soluble	Yes	No	No	Yes	Yes
South Carolina	Total (22), (30)	Available (8a, l), (9a), (11a), (22)	Soluble (22)	Yes (30)	(22)	On registration application only	Yes	Yes
South Dakota	Total	Available (8b, d), (9a)	Water Soluble	Yes	(3)	On registration application only	Yes	Yes
Tennessee	Total	Available (8c, d), (9a, c, d)	Potash	Yes	No	On registration application only	Yes	Yes
Texas	Total	Available (9a, c, d)	Water Soluble	Yes	No	No	Yes	Yes
Utah	Total	Available and Total	Available	Yes	No	No	Yes	Yes
Vermont (1)	Total	Available (8a, d), (9a)	Soluble	Yes	(3)	No	Yes	Yes
Virginia	Total (27)	Available (9a), (8d, l)	Soluble or Available	Yes	Yes	On registration application only (18)	Yes	Yes
Washington	Total	Available (9a)	Soluble	Yes	No	On registration application and label	Yes	Yes
West Virginia	Total	Available (8a), (9a)	Soluble	Yes	Yes	No	Yes	Yes
Wisconsin	Total	Available (9a), (8a, f, g)	Soluble	Yes	No	No	Yes	Yes
Wyoming	Total	Available	Available	Not stated	No	No	Yes	Yes

(14) Penalty of twice the value of the deficiency based on the following tolerance scale:

Total Nitrogen		Available P ₂ O ₅		Soluble K ₂ O	
Guarantee, %	Deficiency	Guarantee, %	Deficiency	Guarantee, %	Deficiency
Up to 8%	0.40	Up to 10%	0.40	Up to 8%	0.30
8-31	0.30	10-24	0.30	8-21	0.40
Over 30	0.75	over 25	0.75	over 20	1.00

(15) One grade of tobacco plant bed fertilizer containing minimum of 16% plant food permitted.

(16) Variations for mineral and organic nitrogen allowable; variation of 0.25% for material containing 2% N or under, 0.33% for material containing 2-3% N; and 0.5% for material containing over 3% N.

(17) From retail dealers in Nebraska only.

(18) Must be given on label of open formula brands.

(19) Director may refuse registration of fertilizer which does not contain at least 0.5% N, 0.5% water soluble K₂O, or 1% P₂O₅.

(20) Do not accept registration guarantees of less than 0.82% N, 1% P₂O₅, 1% K₂O.

(21) In mixed fertilizers branded for tobacco following guarantees apply. Field fertilizer: Total nitrogen, nitrate nitrogen, (optional) water insoluble nitrogen, available P₂O₅, soluble or available potash, maximum chlorine, total magnesium oxide.

Plant bed fertilizer: Total nitrogen, nitrate nitrogen (optional), water insoluble nitrogen (optional), available P₂O₅, soluble or available potash, maximum chlorine, total magnesium oxide.

(22) Mixed fertilizers branded for tobacco guaranteed for total and water insoluble nitrogen (nitrate nitrogen guarantee optional), available P₂O₅, soluble potash, maximum chlorine, total magnesium or magnesium oxide, potential acidity or basicity, (optional). Acid or non-acid forming guarantee required.

(23) See law for exemption—lower analysis mixture may be registered if request accompanied with copy of complete formula showing all ingredients and amounts used.

(24) For mixed fertilizers other than those branded for tobacco, water insoluble nitrogen may be guaranteed.

(25) Mixtures must contain minimum of 3% N.

STATE	INSPECTION FEES		Method of Analysis	TOLERANCES ON ANALYSIS GUARANTEES	PENALTIES
	Dollars Per Ton	Basis for Payment			
Alabama	0.30	Monthly Tonnage Report (2)	AOAC	5 per cent below guaranteed commercial value, 30 pounds CaCO ₃ equiv. for acid or non-acid farming detn.	Refund
Arizona (1)	0.12	Quarterly Tonnage Report	AOAC	Graduated scale for each plant food (13).	Refund
Arkansas	0.37½	Monthly Tonnage Report	AOAC	3-5% below guaranteed penalty actual deficiency; over 5% penalty is three times total deficiency.	Refund and Fine
California	0.15	Quarterly Tonnage Report	AOAC	¼ of 1% N, 1% avail. P ₂ O ₅ , ½ of 1% K ₂ O. For agric. minerals 5% below guaranteed total.	Fine and/or revocation of license after hearing
Colorado	0.25	Semi-Annual Tonnage Report (40)	AOAC	5% below guarantee for any constituent.	Refund and Fine
Connecticut	0.06	Semi-Annual Tonnage Report	AOAC	0.1% N, 0.2% P ₂ O ₅ , 0.2% K ₂ O.	Fine
Delaware	0.10	Annual Tonnage Report	State	Not stated in law.	Fine
Florida	0.25	Monthly Tonnage Report (2)	AOAC	See law for provisions.	Refund and Fine (5)
Georgia	0.30	Monthly Tonnage Report (2)	State	10% on any plant food, 5% on commercial value.	Refund
Idaho	0.10	Quarterly Tonnage Report	AOAC	5% in one or more constituents or in weight.	Refund and Fine
Illinois	0.10	Semi-Annual Tonnage Report	AOAC	10% of any constituent, or 0.4% N, 1% avail. P ₂ O ₅ , 1% K ₂ O.	Fine
Indiana	0.25	Quarterly Tonnage Report (2)	AOAC	Not stated in law.	Refund and Fine
Iowa	0.10	Semi-Annual Tonnage Report	AOAC	Not stated in law.	Fine
Kansas	0.15	Semi-Annual Tonnage Report	State	Not stated in law.	Fine
Kentucky	0.50	Monthly, Quarterly, or Semi-Annual Tonnage Reports	AOAC	0.25% in any essential ingredient.	Fine
Louisiana	0.25	Quarterly Tonnage Report	AOAC	Graduated scale for each plant food. (14)	Deficiency Penalty (14)
Maine	0.01	Annual Tonnage Report	AOAC	Not stated in law.	Fine
Maryland	0.10	Annual Tonnage Report	Not stated	Not stated in law. (16)	Fine
Massachusetts	0.06	Semi-Annual Tonnage Report	AOAC	Not stated in law.	Fine
Michigan	0.8	Semi-Annual Tonnage Report	State	Not stated in law.	Fine
Minnesota	0.05	Semi-Annual Tonnage Report	AOAC	Not stated in law.	Misdemeanor
Mississippi	0.20	Quarterly Tonnage Report	AOAC	4% below commercial value. Tolerance of 80 lbs. of CaCO ₃ per ton in determining acid or non-acid farming properties.	Fine
Missouri	0.30	Semi-Annual Tonnage Report	State	Not stated in law. Fixed by Director of Missouri Agric. Expt. Station.	Misdemeanor
Montana	None	—	AOAC	5% in weight, 5% in one or more constituents.	Refund and Fine
Nebraska	0.10	Semi-Annual Tonnage Report (17)	AOAC	Not stated in law.	Fine
Nevada	0.20 (35)	Quarterly Tonnage Report	AOAC	Graduated scale for each plant food. (13)	Refund and Fine (13)
New Hampshire (1)	None	—	AOAC	Graduated scale for each plant food. (13)	Refund and Fine (13)
New Jersey	0.15	Semi-Annual Tonnage Report	AOAC	Not stated in law.	Fine
New Mexico	0.25	Quarterly Tonnage Report	State	One-fifteenth of guaranteed percentage.	Fine
New York	None	—	State	Not stated in law.	Fine
North Carolina	0.30	Monthly Tonnage Report (2)	AOAC	Graduated scale for each plant food. (13) (5)	Refund and Fine (13)
North Dakota	0.10	Semi-Annual Tonnage Report	AOAC	Not stated in law.	Misdemeanor
Ohio	0.08	Semi-Annual Tonnage Report	AOAC	Not stated in law.	Fine
Oklahoma	0.35	Quarterly Tonnage Report	State	Not stated in law.	Refund and Fine
Oregon (1)	0.10	Quarterly Tonnage Report	AOAC	Not stated in law.	Fine
Pennsylvania	None	—	AOAC	Not stated in law.	Fine
Rhode Island	0.10	Semi-Annual Tonnage Report	AOAC	Not stated in law.	Misdemeanor
South Carolina	0.25	Monthly Tonnage Report	State	Graduated scale for each plant food. (13a), (5)	Refund and Fine (13a) (44)
South Dakota	0.20	Semi-Annual Tonnage Report	AOAC	Not stated in law.	Fine
Tennessee	0.50	Monthly Tonnage Report (2)	State	3% below guaranteed commercial value.	Refund and Fine
Texas	0.25	Quarterly Tonnage Report	AOAC	4% below guaranteed value.	Refund and Fine
Utah	None	—	AOAC	5% below guarantee for any constituent.	Misdemeanor
Vermont (1)	0.15	Annual Tonnage Report	AOAC	Not stated in law.	Fine
Virginia	0.20	Quarterly Tonnage Report	State	5% below guarantee in total value of sum of nitrogen, P ₂ O ₅ , or K ₂ O or 10% below guarantee in any of these plant foods. (5)	Refund and Fine
Washington	0.10	Quarterly Tonnage Report	State	Not stated in law.	Fine
West Virginia	0.25	Semi-Annual Tonnage Report	AOAC	Graduated scale for each plant food. (13)	Refund and Fine (13)
Wisconsin	0.05	Semi-Annual Tonnage Report	AOAC	Not stated in law.	Fine
Wyoming	0.20	Annual Tonnage Report	State	Not stated in law.	Fine

(26) In registration, must state minimum per cent of total N, per cent of nitrogen of mineral origin, and per cent of nitrogen of organic nature.

(27) Nitrate nitrogen and water insoluble nitrogen may be claimed.

(28) Total N, nitrate N, ammoniacal N, water sol. org. N, water insoluble N.
(a) California law requires forms of nitrogen be stated as nitric, ammoniac, organic, and total with separate percentage of each amount present if claimed.

(29) All fertilizer branded for tobacco must contain 2 per cent MgO for field fertilizer and 1 per cent for plant bed fertilizer.

(30) For mixed fertilizers other than those branded for tobacco, water insoluble nitrogen and magnesium or total magnesium oxide may be guaranteed optionally.

(31) Guarantee to state minimum percentage of water soluble magnesium and/or total magnesium.

(32) Source and within 10 per cent of sources of available P₂O₅, organic and inorganic nitrogen materials, and potash. In some cases, per cent water soluble N must be declared. Filler and source must be stated.

(33) Other guarantees may be made on an elemental basis if such elements are recommended by the Experiment Station and found to be beneficial to crops.

(34) Minimum for rock phosphate and similar materials set at 18% total P₂O₅.

(35) \$0.02 per ton for bulk sales.

(36) Renewal fee \$1.00 for each brand.

(37) Graduated, fees based on amount sold during appropriate preceding year. The fee is \$15 for 150 tons or less; \$20 for 150-250 tons; \$30 for 250-400 tons; \$40 for 400-500 tons; \$50 for amounts over 500 tons. New Brands \$15.

(38) For brands having more than one fertilizer material. Fee is \$8.00 per brand when only one fertilizer is guaranteed.

(39) A fee of ten dollars for each succeeding registration of same, and two dollars and fifty cents for each analysis under each separate brand.

(40) Registrant must submit report of shipment to Commissioner within 5 days.

(41) Registration application includes the kind and minimum percentage of any and all other constituents relied upon as contributing to the value of the commercial fertilizer. The kind and maximum percentage of any substances used as filler must be given in the registration application.

(42) Additional plant food elements may be guaranteed by permission of the Commissioner.

(43) Form and manner as prescribed by Director, Kentucky Agricultural Experiment Station.

(44) Penalty three times the value of the shortage for N and four times the value of the shortage for P₂O₅ and K₂O.

(45) In containers of 5 pounds. \$10 in packages of 5 pounds or less.

ALABAMA

Grades approved for general agricultural purposes during fiscal year Oct. 1, 1955-Sept. 30, 1956:

0-12-20	3-9-9*	6-8-4
0-14-14	4-10-7	6-8-8
0-16-8	4-12-12	8-8-2*
0-20-20	4-16-8	8-8-8
0-28-14	5-10-5	14-0-14

*Tobacco special

*Fish Pond special

Trial Grades:

8-20-14	13-13-13
10-10-10*	14-14-14

*non-filler fertilizer.

ARIZONA

No accepted grade list. Minimum plant food requirement: 12%.

ARKANSAS

Ratios and minimum grades for 1955-56 crop year, approved July 15, 1955:

Ratio	Minimum	Grade	Approved
0-1-1		0-14-14	
0-1-2		0-10-20	
0-2-1		0-16-8	
1-1-1		8-8-8	
1-1-2		6-6-12	
1-2-1		6-12-6	
1-2-2		6-6-12	
1-4-4		8-20-20	
2-3-9		6-9-27	
3-4-6		6-8-12	
4-0-0		12-15-0	

CALIFORNIA

No approved grade list.

COLORADO

No controlled grade list. Minimum plant food requirements: 18% minimum available phosphoric acid for superphosphate.

20% minimum guarantee for sum of nitrogen, available phosphoric acid and water-soluble potash.

10% minimum total soluble elements for soil amendments; only following elements recognized in water soluble form: iron, sulfur, copper, manganese, zinc, boron and cobalt. Elements claimed as soluble must be printed on container, but only total amount of soluble elements need be stated. 20% minimum total of non-soluble elements for soil amendments. Only calcium, Magnesium and sulfur shall be recognized in this group.

Specialty fertilizer includes only fertilizer composed of water soluble nitrogen, available phosphoric acid and water soluble potash, whether in combination or singular. When sold as specialty fertilizer, only the nitrogen, phosphoric acid and potash formula shall be used; formula and specific intended use must be shown on container. Any formulation of the three ingredients may be used.

Note: Soil amendments (any materials applied to the soil for the purpose of changing soil alkalinity, or exchangeable base percentages or to increase the trace elements potentials) must show on container the intended use along with the phrase "Not to be sold as a fertilizer."

CONNECTICUT

No compulsory grade limitation. Approved list of ratios and minimum grades set out by Agricultural Experiment Station:

Ratio	Minimum Grade
0-1-1	0-14-14
0-1-2	0-10-20
1-1-1	8-8-8
1-1-3	5-5-15*
1-2-1	5-10-5
1-2-2	5-10-10
2-1-2	6-3-6*
3-4-4	6-8-8
4-3-1	8-6-2†
8-8-7	5-8-7

* Tobacco fertilizer

† For maintenance of established turf.

FLORIDA

No approved grade list.

GEORGIA

No compulsory grade limitation. Minimum plant food content for mixed fertilizers: 14 units plant food.

GRADE REGULATIONS

for Mixed Fertilizers and Materials

UNITED STATES, POSSESSIONS, AND CANADA

Prepared by Commercial Fertilizer and Plant Food Industry

IDAHO

No limitation of grades accepted for registration. Container must show minimum percentage and source of each: nitrogen in available form, available phosphoric acid; potash soluble in distilled water.

ILLINOIS

Permits sale of any grade of fertilizer, but requires that mixed fertilizers containing two or more primary constituents (nitrogen, phosphoric acid, potash) have combined percentages of such constituents equalling at least 20%.

INDIANA

Approved ratios and minimum grades effective July 1, 1955:

Ratio	Minimum Grade
0-1-1	0-20-20
0-1-2	0-10-20
0-1-3	0-10-30
0-2-1	0-20-10
1-1-1	10-10-10
1-2-2	8-16-16
1-3-6	3-9-18
1-3-9	3-9-27
1-4-0	8-32-0
1-4-2	4-16-8
1-4-4	4-16-16
2-1-1	14-7-7

Regional minimum concentration of 27 units suggested for Indiana.

IOWA

No limitation on grades accepted for registration.

KANSAS

Law has no provision for approval of grades.

KENTUCKY

Recommended ratios and minimum grade recommendations for 1955-56 crop year:

Ratio	Minimum Grade	Recommended
0-1-1	0-12-12	
0-1-2	0-10-20	
0-2-1	0-14-7	
1-1-1	8-8-8	
1-1-3	6-6-18	
1-2-2	5-10-10	
1-2-3	5-10-15	
1-3-2	4-12-8	
1-4-4	3-12-12	

LOUISIANA

Fertilizer grades that will be registered during 1955-56 season, beginning Sept. 1, 1955:

0-10-20	4-12-4	6-8-12
0-14-14	10-30-10	8-8-8
0-15-15	4-12-6	10-10-10
0-20-20	5-10-5	12-12-12
0-16-8	9-18-9	13-13-13
0-36-12	10-20-10	10-5-10
3-12-12	12-24-12	10-10-5
5-20-20	5-10-10	10-10-0
6-24-24	10-20-20	15-15-0
	6-8-8	12-6-8

Mixed Specialty Fertilizer: Any grade containing 20 units or more of plant food—one grade only.

MATERIALS

Nitrate of Soda	16-0-0
By-product Nitrate of Soda	15-0-0
Nitranol	15-0-0
Nitrate of Potash	15-0-14
Sulphate of Ammonia	10*-0-0
Cyanamid	20*-0-0
Urea	42*-0-0
Ammoniated Superphosphate	4*-16*-0
Ammonium Phosphate	11-48-0
Ammonium Phosphate-Sulphate	16-20-0
Cal-Nitro	20*-0-0
Ammonium Nitrate-Limestone	20*-0-0
Ammonium Sulphate-Nitrate	26-0-0
Ammonium Nitrate	32.5*-0-0
Potassium Nitrate	12-0-44*
Superphosphate	0-18*-0
Muriate of Potash	0-0-50*
Sulphate of Potash	0-0-48*
Manure Salts	0-0-22*
Sulphate of Potash-Magnesia	0-0-21*
Potash Lime	0-0-6
Ground Phosphate Rock	any-grade
Soft Phosphate with Colloidal Clay	any-grade
Cotton Hull Ash	any-grade
Wood Ash	any-grade
Bone Meal	any meal
Organic Carriers of Nitrogen	any-grade
Anhydrous Ammonia	81-0-0
Aqua Ammonia	24-0-0
Basic Slag	

MAINE

No limitation on grades and no minimum plant food requirement except that element present in quantity less than .005% must be expressed as "Trace" in labeling.

MARYLAND

Fertilizer ratios and analyses recommended by the State Agronomy Department, effective Jan. 1, 1955. Suggested Standard Grades:

Ratio	Minimum Analysis	High Analysis
0-1-1	0-14-14	0-20-20
	0-14-14	0-20-20
	(60 lbs. borax/ton)	(80 lbs. borax/ton)
0-1-2	0-10-20	0-15-30
1-1-1	8-8-8	10-10-10
1-2-1	5-10-5	8-16-8
1-2-2	5-10-10	8-16-16
1-2-3	4-8-12	5-10-15
1-2-4	4-8-16	5-10-20
1-3-3	4-12-12	5-15-15

Suggested Special Grades:

Ratio	Recommended Analysis
For tobacco*	
1-2-3	4-8-12
1-4-8	2-8-16
For raspberries	
5-3-2	10-6-4

*Other grades of the same ratio above the minimum analysis are acceptable.

*Special grades for tobacco, with potash in sulfate form. Fertilizer to be prepared so it contains 2% MgO.

MASSACHUSETTS

No officially approved or recommended list of fertilizer grades.

MICHIGAN

Recommendations for present and coming year:

Ratio	Minimum Grade
0-1-1	0-12-12
0-1-2	0-10-20
0-1-3	0-8-27
0-2-1	0-20-10
1-1-1	8-8-8

Ratio	Minimum Grade
1-2-2	6-12-12
1-3-6	3- 9-18
1-3-9	3- 9-27
1-4-1	4-16- 4
1-4-2	4-16- 8
1-4-4	3-12-12
1-6-3	3-18- 9
2-1-1	12- 6- 6

(Carriers of nitrogen, phosphorus and potassium)

Use of higher grades of the recommended ratios is encouraged.

Unmixed Materials: Permitted regardless of their nitrogen, phosphorus or potash content.

MINNESOTA

Grades recommended by Department of Soils, University of Minnesota, for efficient use on soils and for crop conditions, and also as being acceptable for registration:

Recommended Ratio	Recommended Minimum Grade
0-0-1	0- 0-50
0-1-0	0-20- 0
0-1-1	0-20-20
0-1-2	0-10-20
0-1-3	0- 9-27
0-2-1	0-10-20
1-0-0	20- 0- 0
1-1-1	10-10-10
1-2-0	10-20- 0
1-2-1	10-20-10
1-2-2	6-12-12
1-3-6	3- 9-18
1-4-0	6-24- 0
1-4-2	5-20-10
1-4-4	4-16-16

Other grades applicable:

Anhydrous ammonia	80- 0- 0
Nitrogen solution	27* 0- 0
Nitrate of soda	16- 0- 0
Byproduct nitrate of soda	14- 0- 0
Nitrate of potash	14- 0-14
Sulphate of ammonia	20* 0- 0
Cyanamid	20* 0- 0
Uramon	42- 0- 0
Ammoniated superphosphate	27* 0- 0
Ammonium phosphate	11-48- 0
Ammonium phosphate sulphate	13-39- 0
Ammonium phosphate-sulphate	16-20- 0
Cal-nitro	20* 0- 0
A-N-L	20* 0- 0
Ammonium nitrate	30* 0- 0
Potassium nitrate	14- 0-44*
Superphosphate	0-18* 0
Muriate of potash	0- 0-50*
Sulphate of potash	0- 0-48*
Manure salts	0- 0-22*
Sulphate of potash magnesia	0- 0-18*
Potash lime	0- 0-16
Ground phosphate rock	Any Grade
Colloidal phosphate	Any Grade
Cotton hull ash	Any Grade
Wood ash	Any Grade
Straight carriers of organic nitrogen.	(or higher)

MISSISSIPPI

Minimum grades and ratios of fertilizers and fertilizer materials acceptable for sale for the year 1956. (NOTE: The following grades for 1956 cannot be registered and sold prior to January 1, 1956 unless they are on the list of grades for 1955.)

Mixed Goods:	Ratio	Minimum Grade
	1-1-1	8- 8- 8
	1-2-1	5-10- 5
	1-2-2	5-10-10
	1-4-4	3-12-12
	2-1-2	10- 5-10
	2-2-1	8- 8- 4
	3-2-2	12- 8- 8
	3-4-2	6- 8- 4
	3-4-4	6- 8- 8
any multiple		4-10- 7

Two Elements:

Any combination of nitrogen and phosphate containing not less than 20 units of available plant food.

Any combination of phosphate and potash containing not less than 24 units of available plant food.

Nitrogen Materials: 16% nitrogen and non-manipulated materials of higher percentage. Aqua ammonia not less than 20% nitrogen. Anhydrous ammonia not less than 82% nitrogen.

Phosphate Materials: 18% superphosphate and above.

Potash Materials: 22% potash salts (manure salts); 50% muriate of potash and above; Sul-Po-Mag.

Specialty Fertilizers: In addition to the regular, approved grades, specialty fertilizers may be registered for sale, provided they contain a minimum of 16 units of available plant food, and they must contain a minimum of 3% nitrogen, or 2% phosphoric acid, or 3% potash, as required by the laws of the state. The registration fee and tax must be paid as on all other brands and grades of fertilizer.

Any broken packages must contain the same identification as the original or unbroken packages.

Specialty fertilizers sold in packages larger than 25 pounds must bear, in addition to the regular guarantee analysis tag, a tag stating the specific purpose for which the fertilizer is to be used. This tag shall also bear the statement, "This fertilizer is not formulated for, nor is it to be sold for general agricultural purposes."

Borax Added: (Not to exceed 80 pounds per ton.) A red tag, showing pounds borax per ton, shall be attached to each bag of fertilizer containing borax, with the statement that this type of fertilizer can be used only under crops for which it is recommended.

MISSOURI

Law makes no provision for grade discrimination. Soils Department has recommended only that purchaser buy whatever grade fills plant food needs, as shown by soil tests, at the lowest price per pound of plant nutrient.

MONTANA

Recommended grades at present:
1-1-0; 1-2-0; 1-4-0; 2-1-0; 3-2-0.

NEBRASKA

Fertilizer registrations not restricted to list of approved grades.

Minimum plant food requirement: sum of total nitrogen, available phosphoric acid and soluble potash must be a total of 18% or more.

Extension Service suggests following ratios and minimum grades for year beginning July 1, 1955:

Suggested Ratio	Suggested Minimum Grade
1-1-0	15-15- 0
1-2-0	10-20- 0
1-2-1	10-20-10
1-3-0	13-39- 0
1-3-1	8-24- 8
1-4-0	8-32- 0

NEVADA

Law does not allow officials to specify grades to be sold; no recommended list of grades compiled.

NEW HAMPSHIRE

Does not publish or promulgate a list of grades approved or recommended. **Minimum Plant Food Requirement:** New model fertilizer law adopted by 1955 Legislature, effective Jan. 1, 1956 (rules and regulations to be prescribed and adopted after public hearing held in September, 1955), provides as follows: Not less than 20% plant food, except 18% for superphosphate, and 16% for a product containing 25% or more of its nitrogen in water-soluble form. Natural animal manure and bird manure excepted from this provision.

NEW JERSEY

Law does not give authority to refuse registration of other grades, but following is list of grades recommended by Agricultural Experiment Station for agricultural crops:

Ratio	Low Analysis	High Analysis
0-1-1	0-14-14	0-20-20
0-1-2	0-10-20	0-15-30
1-0-1	14- 0-14	20- 0-20
1-1-1	8- 8- 8	10-10-10*
1-1-2	7- 7-14	10-10-20
1-2-1	5-10- 5	8-16- 8
1-2-2	5-10-10	8-16-16
1-3-2	4-12- 8	none
1-3-4	3- 9-12	none
1-4-2	3-12- 6	4-16- 8

*or higher.

NEW MEXICO

Approved ratios and minimum grades:

Ratio	Minimum Grade
0-1-1	0-14-14
0-2-1	0-16- 8
1-1-0	10-10- 0
1-1-1	8- 8- 8
1-2-0	7-14- 0
1-2-1	5-10- 5
1-2-2	5-10-10
1-2-3	4- 8-12
1-3-1	4-12- 4
1-3-6	3- 9-18
1-4-4	3-12-12
2-1-0	14- 7- 0
2-2-1	10-10- 5
3-4-6	6- 8-12

NEW YORK

No regulation of grades sold. No minimum plant food requirement.

In addition to guarantees of primary plant food present, law requires percentage guarantees of any secondary elements or minor elements claimed to be present. Extension Service recommendations include following ratios and grades:

Ratio	First Choice	Alternate
0-1-1	0-20-20	0-14-14
0-1-2	0-15-30	0-12-24
1-1-1	10-10-10	7- 7- 7
	12-12-12	
	13-13-13	
1-2-1	8-16- 8	6-12- 6
	10-20-10	or
	12-24-12	5-10- 5
1-2-2	8-16-16	5-10-10
	10-20-20	

For vegetables and potatoes—

Ratio	Preferred	Common Substitutes
1-1-1	10-10-10	7- 7- 7
1-2-1	10-20-10	8-16- 8
		6-12- 6
		5-10- 5
1-2-2	8-16-16	8-10-10
1-2-3	6-12-18	5-10-15
		4- 8-12
1-3-1	6-18- 6	4-12- 4

NORTH CAROLINA

Fertilizer grade list, 1955-56:

Grades for tobacco only ¹ :	
2-10- 8	6-12-15
3- 9- 6	4- 9- 3 (plant beds)
4- 8-10	8- 0-24 (top dresser)
Grades for tobacco ² and general crops:	
3- 9- 9	8- 8- 8
Grades for general crops:	
0- 9-27	4- 8-12
0-10-20	4-10- 8*
0-14-14	4-12-12
2-12-12	5-10-10
3- 8- 9	6- 6-12
3- 9-18	6- 8- 6*

¹According to recommendations of the Tobacco Workers' Conference with respect to source of nitrogen, one-fifth should be derived from standard nitrate sources.

²Retained on list with warning that grade will be considered for removal from the list for 1956-57.

Any distributor may be permitted to sell one but not exceeding one grade of specialty fertilizer not on the current approved list. The commissioner may, in his discretion, require a sample label to be submitted before registering such fertilizer.

NORTH DAKOTA

No limitation on number of grades that may be sold.

Minimum Plant Food Content: 16% available phosphoric acid for superphosphate, 25% sum of nitrogen, available phosphoric acid and soluble potash for mixed fertilizers—except 18% for complete fertilizers containing one-fourth or more of their nitrogen in water-insoluble forms of plant or animal origin.

OHIO

No approved or recommended list of grades of fertilizers. Manufacturers may sell any grade which they wish to make.

OKLAHOMA

Approved ratios and minimum grades for fiscal year, 1955-56:

Ratio	Minimum Grade
0-1-1	0-12-12
0-2-1	0-14- 7
1-1-0	10-10- 0
1-1-1	8- 8- 8

Ratio	Minimum Grade
1-2-0	7-14- 0
1-2-1	5-10- 5
1-2-2	5-10-10
1-3-1	4-12- 4
1-3-2	3- 9-12
1-4-4	3-12-12
2-2-1	10-10- 5
3-4-6	6- 8-12
3-5-2	6-10- 4

OREGON

Has no approved grade list.

PENNSYLVANIA

Does not publish approved or recommended grade list.

RHODE ISLAND

No grade limitation, but suggest ratio and grade list set up by New England agronomists:

Ratio	Recommended Minimum	Grades Reported
0-1-1	0-14-14	0-14-14
0-1-2	5-10-20	0-10-20 0-12-24 0-15-30
1-1-1	8- 8- 8	8- 8- 8 10-10-10
1-3-1	5-10- 5	5-10- 5 6-12- 6 8-16- 8 10-10-10
1-3-2	5-10-10	5-10-10 6-16-16
3-4-4	6- 8- 8	6- 8- 8 5- 8- 7
4-3-1	8- 8- 2	8- 6- 2 10- 6- 4

SOUTH CAROLINA

Fertilizer grade ratios and minimum analysis for each ratio approved for sale for 1955-56 fiscal year.

No.	Ratio	Minimum Analysis	Units
1.	1-3-2	3- 9- 6	18*
2.	2-3-1	6- 9- 3	18*
3.	1-3-3	3- 9- 9	21
4.	1-3-4	3- 9-12	24
5.	1-4-4	3-12-12	27
6.	1-3-3†	4-12-12	28
7.	1-3-6	3- 9-16	30
8.	2-5-3	4-10- 6	20
9.	1-2-2	4- 8- 8	20
10.	1-2-3	4- 8-12	24
11.	1-2-1	5-10- 5	20
12.	1-2-2†	5-10-10	25
13.	3-5-2	6-10- 4	20
14.	3-4-3	6- 8- 8	20
15.	1-1-1	6- 8- 8	24
16.	1-0-1	14- 0-14	28
17.	1-0-3	8- 0-24	32
18.	0-1-1	0-14-14	28
19.	0-1-2	0-10-20	30

*These grades must contain 25% or more of the nitrogen in water insoluble form.

†These ratios duplicated earlier in list.

Note: Any multiple of the approved ratio is permissible.

Farmers' or Customers' mixtures must conform to the above.

SOUTH DAKOTA

Has no list of approved or recommended grades of fertilizer.

TENNESSEE

Accepts all grades of fertilizer for registration that run as much as 16 units of plant food.

Agricultural Experiment Station and Extension Service recommendations for various soils, crops include following grades:

3- 8-18*	3-12-12	4-12-4	4-16- 8
3-12- 6	4- 8-12	4-12-8	6-12-12

Side or top dressing: 0-10-20 0-20-10 0-9-27

Note: Burley tobacco fertilizers: Potash from sources other than muriate.

TEXAS

Ratios and minimum grades to be approved for sale during year beginning September 1, 1955:

Ratio	Minimum Grade
0-1-1	0-14-14
0-2-1	0-16- 8
1-1-0	10-10- 0
1-1-1	8- 8- 8
1-2-0	7-14- 0
1-2-1	5-10- 5
1-2-2	5-10-10
1-2-3	4- 8-12
1-3-1	4-12- 4
1-4-4	3-12-12
2-1-0	14- 7- 0
2-1-1	10- 5- 5
2-2-1	10-10- 5
3-4-6	6- 8-12

UTAH

Does not limit grades, nor issue an approved list.

VERMONT

No required fertilizer grade list.

Agronomy Department recommends following grades for use under varying conditions throughout the state:

0-10-20	0-20-20	8- 8- 8
0-14-14	5-10-10	8-16-16
0-15-30	7- 7- 7	10-10-10

VIRGINIA

Fertilizer grades approved for sale and distribution for year July 1, 1955-June 30, 1956:

Ratio	No.	Approved Grades	Units
0-1-1	1.	0-14-14	28
	2.	0-20-20	40
	3.	0-30-30	60
0-1-2	4.	0-10-20	30
	5.	0-15-30	45
	6.	0-20-40	60
0-2-1	7.	0-16- 8	24
	8.	0-40-20	60
1-0-1	9.	14- 0-14	28
	10.	20- 0-20	40
1-1-1	11.	8- 8- 8	24
	12.	10-10-10	30
	13.	12-12-12	36
	14.	13-13-13	39
	15.	14-14-14	42
1-2-1	16.	5-10- 5	20
	17.	10-20-10	40
1-2-2	18.	5-10-10	25
	19.	10-20-20	50
1-3-2	20.	4-12- 8	24
1-3-3	21.	3- 9- 9	21
	22.	4-12-12	28
1-3-4	23.	3- 9-12	24
1-4-2	24.	4-16- 8	28
1-6-6	25.	2-12-12	26
3-4-3	26.	6- 8- 6	20
5-3-2	27.	10- 6- 4	20
Tobacco Grades			
	28.	8- 0-24*	32
	29.	3- 9- 8*	18
1-5-4	30.	2-10- 8*	20
2-4-5	31.	4- 8-10*	22
	32.	6-12-15*	33
3-6-2	33.	6-12- 4†	22
1-2½-¾	34.	4- 9- 3†	16

*These grades to be registered and labeled for use only as Tobacco Fertilizer.

†These grades to be registered and labeled for use only as Tobacco Plant Bed Fertilizer.

WASHINGTON

No registration of grades accepted for registration.

WEST VIRGINIA

Approved list of grades of mixed fertilizers:

0-12-12	4-12- 4	5-10- 5	7- 7- 7
0-14- 7	4-12- 8	5-10-10	10- 6- 4
3-12- 6	4-12-12	6- 8- 6	12- 6- 6

Complete fertilizers which have as their source of nitrogen 25% or more in water insoluble form of plant or animal origin, and in which the total nitrogen, available phosphoric acid and soluble potash is 16%, are acceptable for registration, provided they are maintained in the same ratio as indicated in the above listing.

Note: Specialty fertilizer grades other than those listed above are accepted for registration. State law defines specialty fertilizers acceptable for registration as "a fertilizer which meets the requirements of the law in total plant food, and is generally sold in small packages or containers primarily for use on other than farm land."

WISCONSIN

Has no authority to limit grades. Minimum Plant Food Content Requirement: For mixed fertilizers 24 per cent of

sum of nitrogen, available phosphoric acid and soluble potash. For superphosphate, 18 per cent of available phosphoric acid. For rock phosphate or material of similar origin, 18 per cent of total phosphoric acid. Specialty fertilizers are exempt from minimum plant food requirements for mixed fertilizer.

Extension Service recommendations for various soils, crops include the following grades:

0- 9-27†B	3- 9-16	6- 6-18†Mg
0-10-30	3-12-12	10-10-10
0-20-10	4-16- 8	†B—Boron added
0-20-20	6- 6-18	†Mg—Magnesium added

U. S. POSSESSIONS

Alaska

No laws relating to fertilizer grades in effect at present.

Extension Service recommendations:

Good mixed grades—		
5-20-10	8-24- 8	10-20-20
8-32- 8	10-20-10	11-48- 0
Good, but expensive—		
5-10-10	5-15- 5	10-6-4
Approved fertilizer materials—		
Ammonium Nitrate		33%
Sodium Nitrate		16%
Ammonium Sulfate		21%
Treble superphosphate		46%
Muriate of Potash		60%
Sulfate of Potash		50%

Hawaii

No requirement that fertilizers carry grades that are approved.

Puerto Rico

List of fertilizer grades approved for use:

0- 4-20	8- 6-10*	12- 3-16	14- 0-14
0- 8-20	8- 8-13	12- 4-10	14- 2- 8
0-15-40	8-10- 8	12- 6- 8	14- 4-10
5- 7-20	9-10- 5	12- 6-10	15- 4- 7
5-10-10	10- 6- 8	12- 6-16	16- 4- 5
6- 6-12	10- 6-14	12-10- 5	18- 0- 6
6- 8-10*	10-10- 8	12-12-10	Aqua ammonia (20.5% N)

*These grades intended for tobacco and therefore should be prepared from sulphate of potash. Maximum chloride permitted is 1.0%.

CANADA

The Provincial Fertilizer Boards recommend the fertilizer grades for their respective provinces as follows:

British Columbia

0-12-20	4-10-10	6-30-15
2-15-15	6- 8- 6	8-10- 5
2-16- 6	6-10-10	10-20-10

New Brunswick

0-1-1 ratio, minimum grade 0-14-14; 3-15-6, 5-10-13, 6-12-6, 6-12-12, 9-9-7.

Nova Scotia

0-1-1 ratio, minimum grade 0-14-14; 3-15-6, 5-10-13, 6-12-12, 9-9-7.

Ontario

Grades for 1955-56 not definitely decided upon, so following list may have few slight changes:

0-16- 8	2-12-20	4-24-12
0-12-12	2-16- 6	5-10-13
0-12-20	3-12- 6	10- 5-10
2- 8-16	3-18- 0	10- 6- 4
2-12-10	4-12- 6	10-10-10
2-12-16	4-12-10	12-24-12

0-12-20	2-12-15	3-18-15
2-12-10	2-18-18	3-15-20

Prince Edward Island

0-1-1 ratio, minimum grade 0-14-14; 3-15-6, 5-10-13, 6-12-12.

Quebec

0-16- 8	2-12-10	3-18-0	5-10-13
2- 8-16	2-16- 6	4-12-6	9- 5- 7
Tobacco Fertilizers			
	2-12-10		5-8-10

Prairie Provinces

Use mainly ammonium phosphate 11-48-0 and 16-20-0.

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including Sub-Stations and Directors

United States, Possessions and Canada

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Tuskegee Institute Agricultural Research and Experiment Station. C. T. Mason, Dir.

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Twin Falls Branch Experiment Station: Rt. 1. Marshall LeBaron, Supt.

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Parma Branch Experiment Station. D. F. Franklin, Supt.

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Sandpoint Branch Experiment Station. C. T. Brackney, Supt.

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IOWA

Ames—

Iowa State College of Agriculture & Mechanical Arts, Agricultural Experiment Station and Extension Service. Floyd Andre, Dean Div. of Agriculture, Dir. of Agricultural Experiment Station, Dir. of Ext. Service; G. M. Browning, Assoc. Dir. Agricultural Exp. Sta.; R. K. Frevert, Asst. Dir. Agricultural Experiment Sta.; Marvin Anderson, Assoc. Dir. of Ext. Service.

Outlying Experiment Farms:

Albia—

Albia Pasture Experimental Farm. Floyd Ransom.

Beaconsfield—

Shelby - Grundy Experimental Farm. Kenneth Driftmeir.

Bloomfield—

Southern Iowa Experimental Farm. R. P. Ninholson (Ames).

Castana—

Western Iowa Experimental Farm. Dale Winger.

Conesville—

Southeastern Iowa Experimental Farm. William Roush.

Corydon—

Seymour - Shelby Experimental Farm. R. P. Nicholson (Ames).

Council Bluffs—

Bluffs Experimental Farm. C. C. Doll.

Fruitland—

Muscatine Island Experimental Farm. Lewis Peterson.

Hopkinton—

Brayton Memorial Forest. A. L. McComb (Ames).

Independence—

Carrington - Clyde Experimental Farm. H. R. Meldrum (Ames).

Kanawha—

Clarion-Webster Experimental Farm. Ben Grover (Ames). Northern Iowa Experimental Assn. A. A. Kemp, Mgr.

Saratoga—

Howard County Experimental Farm. S. J. Angstrom (Ames).

Shenandoah—

Soil Conservation Experiment Farm. L. S. Cutter.

KANSAS

Manhattan—

Kansas State School of Agriculture and Applied Science: Arthur D. Weber, Dean, School of Agriculture and Dir., Agricultural Experiment Station; Harold E. Myers, Assoc. Dir.; C. Peairs Wilson, Asst. Dir. Agric. Exper. Station; L. C. Williams, Dean and Dir., and Paul W. Griffith, Assoc. Dean and Dir., Division of Extension.

Branch Stations:

Colby—

Branch Station. E. H. Coles, Supt.

Garden City—

Experiment Station. A. B. Erhart, Supt.

Hays—

Ft. Hays Branch Experiment Station. W. W. Duitsman, Supt.

Mound Valley—

Mound Valley Branch Experiment Station. Floyd E. Davidson, Supt.

Tribune—

Tribune Experiment Station, T. B. Stinson, Supt.

KENTUCKY

Lexington—

University of Kentucky, College of Agriculture and Home Economics, Agricultural Exp. Station and Agricultural Extension Service. Frank J. Welch, Dean of College, Dir. of Exp. Station and Extension Service; L. J. Horlacher, Assoc. Dean, College of Agr. and Home Ecs.; W. P. Garrigus, Assoc. Dir. of Exp. Sta.; E. J. Nesius, Assoc. Dir. Extension Service.

Substations:

Princeton—

Western Kentucky Substation. S. J. Lowry, Supt.

Quicksand—

Robinson Agricultural Experiment Substation. Roger W. Jones, Supt.

LOUISIANA

Baton Rouge—

Louisiana State University, Agricultural Experiment Station. J. Norman Efferson, Dir.; I. L. Forbes, Asst. Dir.; H. C. Sanders, Dir. Agricultural Extension Service.

Substations:

Bossier City—

Red River Valley Station. J. Y. Oakes, Supt.

Calhoun—

North Louisiana Station. R. S. Woodward, Supt.

Crowley—

Rice Experiment Station, Rufus K. Walker, Supt.

De Ridder—

West Louisiana Experiment Station. C. B. Roark, Supt.

Diamond—

Plaquemines Parish Station, R. T. Brown, Supt.

Hammond—

Fruit & Truck Station, W. F. Wilson, Jr., Supt.

Homer—

North Louisiana Hill Farm Experiment Station. D. M. Jones, Supt.

St. Joseph—

Northeast Louisiana Station. John Hendrix, Supt.

Southeast—

Southeast Louisiana Station. H. DeWitt Ellzey, Jr., Supt.

MAINE

Orono—

University of Maine, College of Agriculture and Agricultural Experiment Station. A. L. Deering, Dean of Agriculture; G. F. Dow, Assoc. Dir. of Experiment Station, G. E. Lord, Assoc. Dir. of Extension Service; W. C. Libby,

Assoc. Dean, College of Agriculture.

Sub-Stations:

Jonesboro—

Blueberry Hill Farm. I. C. Mason, Farm Supt.

Monmouth—

Highmoor Farm. Frank J. McDonald, Farm Supt.

Presque Isle—

Aroostook Farm. Roger M. Cobb, Farm Supt.

MARYLAND

College Park—

University of Maryland, College of Agriculture & Agricultural Experiment Station. I. C. Haut, Dir.; J. M. Gwin, Dir. Extension Service.

MASSACHUSETTS

Amherst—

University of Massachusetts, School of Agriculture and Agricultural Experiment Station. Dale H. Sieling, Dean and Dir.; J. W. Dayton, Assoc. Dean and Dir. Extension Service; Fred P. Jeffrey, Assoc. Dean of Agriculture and Dir. of the Stockbridge School.

East Wareham—

Cranberry Experiment Station. C. E. Cross, in charge.

Waltham—

Waltham Field Station. John R. Havis, in charge.

MICHIGAN

East Lansing—

Michigan State College of Agriculture and Agricultural Experiment Station. T. K. Cowden, Dean of Agriculture; L. M. Turk, Asst. Dean and Dir. Experiment Station; P. A. Miller, Asst. Dean and Dir. Ext. Service.

Sub-Stations:

Augusta—

W. K. Kellogg Station. C. M. McCrary, Supt.

Chatham—

Upper Peninsula Experiment Station. R. E. Horwood, Supt.

Grand Rapids—

Graham Horticultural Experiment Station: 2989 Lake Michigan Drive. W. Walter Toenjes, Supt.

Lake City—

Lake City Experiment Station, A. M. Berridge, Supt.

Sault Ste. Marie—

Dunbar Forest Experiment Station. M. W. Day, Supt.

South Haven—

South Haven Horticultural Experiment Station. Stanley Johnston, Supt.

MINNESOTA

St. Paul—

University of Minnesota, Institute of Agriculture. Harold Macy, Dean; T. H. Fenske, Asst. Dean; H. J. Sloan, Dir. of Agricultural Experiment Station; Wm. P. Martin, Head Dept. of Soils; Skuli Rutherford, Dir. Extension Service; Roland Abraham, Asst. Dir. Extension Service.

Branches—

Cloquet—

Forestry Station. T. Schantz-Hansen, in charge.

Castle Danger—
Potato Breeding Farm. F. A. Krantz, in charge.

Crookston—
Northwest Experiment Station. T. M. McCall, Supt.; O. C. Soine, Agronomy and Soils.

Duluth—
Northwest Experiment Station. Ralph S. Grant, Supt.; Wallace W. Nelson, Agronomy and Soils.

Excelsior—
Fruit Breeding Farm. T. S. Weir, Asst. Supt.

Grand Rapids—
North Central Experiment Station. C. L. Cole, Supt.; C. H. Griffith, Agronomy and Soils.

Morris—
West Central Experiment Station. Allen W. Edson, Supt.; R. O. Bridgford, Agronomy & Soils.

Rosemount
Agricultural Experiment Station Branch. A. C. Heine, Supt.

Waseca—
Southeast Experiment Station. R. E. Hodgson, Supt.; John R. Thompson, Agronomy and Soils.

MISSISSIPPI

State College—
Mississippi Agricultural Experiment Station. Clay Lyle, Dean and Dir. Div. of Agriculture; Henry H. Leveck, Assoc. Dir.; Mose S. Shaw, Assoc. Dir. Extension Service.

Branch Stations:

Brooksville—
Black Belt Branch Station. Louie Walton, Supt.

Crystal Springs—
Truck Crops Branch Station. John A. Campbell, Supt.

Holly Springs—
North Miss. Branch Experiment Station. S. P. Crockett, Supt.

Natchez—
Natchez Branch Station. Richard E. Deese, Supt.

Newton—
Coastal Plain Branch Station. Roy Kuykendall, Supt.

Poplarville—
South Mississippi Branch Experiment Station. T. E. Ashley, Supt.

Pontotoc—
Pontotoc Ridge-Flatwood Branch Exp. Station. B. C. Hurt, Supt.

Raymond—
Brown Loam Branch Station. John B. Gill, Supt.; Robt. E. Coats, Agronomist.

Stoneville—
Delta Branch Station. Wm. L. Giles, Supt.

Verona—
Northeast Miss. Branch Station. R. C. Albritton, Supt.

West Point—
West Point Pilot Farm. William S. Byars, Supt.

MISSOURI

Columbia—
University of Missouri, Division of Agricultural Sciences, College of Agriculture; Agricultural Ex-

periment Station. J. H. Longwell, Dir., Dean of the College of Agriculture in Charge of Fertilizer Control; Sam B. Shirky, Assoc. Dean and Dir.; J. W. Burch, Extension Dir.

Hannibal—
Hatch Dairy Experimental Farm. Horace Peet, Supt.

Pierce City—
Southwest Missouri Experimental Field. Carl Hayward, Supt.

Sikeston—
Southeast Missouri Experimental Field; Norman Brown, Supt.

Wentzville—
Weldon Springs Experimental Field. Gerald Wright, Supt.

MONTANA

Bozeman—
Montana State College. M. M. Kelso, Dir., Agricultural Experiment Station; N. E. Beers, Dir., Extension Service; H. G. Cockrum, Asst. Dean of Agriculture.

Branch Stations:

Corvallis—
Horticultural Branch Station. A. L. Richardson, Supt.

Creston—
Northwestern Montana Branch Station. C. W. Roath, Supt.

Havre—
North Montana Branch Station. J. J. Strum, Supt.

Huntley—
Huntley Branch Station. T. S. Aashiem, Supt.

Miles City—
U. S. Range Livestock Experiment Station. J. R. Quesenberry, Supt.

Moccasin—
Central Montana Branch Station. R. M. Williams, Agron. & Supt.

Sidney—
Eastern Montana Branch Station. G. P. Hartman, Supt.

NEBRASKA

Lincoln—
University of Nebraska; College of Agriculture, Agricultural Experiment Station, and Agricultural Extension Service. W. V. Lambert, Dean and Dir.; E. F. Frolik, Assoc. Dir. of Experiment Station; E. W. Janike, Assoc. Dir. of Extension Service.

Branch Stations:

Alliance—
Box Butte Experiment Farm. Robert O'Keefe, Supvr.

Crawford—
Ft. Robinson Beef Cattle Research Station. Robert Koch, Supt.

Mitchell—
Scotts Bluff Experiment Station. Lionel Harris, Supt.

North Platte—
North Platte Experiment Station. James C. Adams, Supt.

NEVADA

Reno—
University of Nevada, College of Agriculture and Agricultural Experiment Station. John R. Bertrand, Dean and Dir., College of Agric.; C. E. Fleming, Assoc. Dir., Agric. Exp. Sta., Asst. Dir.; W. G. Stucky, Ext. Service; E. E. Wittwer, Assoc. Dir., Resident Instruction.

Contact—
Knoll Creek Field Station. Clark R. Torell, Supt.

Fallon—
Newlands Field Station. John A. McCormick, Supt.

Logandale—
Southern Nevada Field Station. Ray K. Peterson, Supt.

NEW HAMPSHIRE

Durham—
University of New Hampshire, College of Agriculture and Agric. Experiment Station, H. C. Grinnell, Director, M. C. Richards, Assoc. Dir., L. A. Bevan, Dir. Agr. Ext. Service, S. W. Hoitt, Assoc. Dir.

NEW JERSEY

New Brunswick—
The State University of New Jersey, College of Agriculture and Agricultural Experiment Station. William H. Martin, Dean of College and Dir. of Experiment Station & Extension Service; Lindley G. Cook, Assoc. Extension Dir.; O. Starnes, Asst. Dir. of Experiment Station.

Sub-Stations:

Bivalve—
Oyster Research Laboratory, Harold H. Haskin.

Millville—
Turkey Research Farm. Jno. J. Dowling.

Pemberton—
Cranberry and Blueberry Research Laboratory, C. A. Doehlert.

Sussex—
Dairy Research Farm. Claude Eby.

Vineland—
Poultry Pathology Laboratory, Landis & Brewster. James J. Black.

NEW MEXICO

State College—
New Mexico College of Agriculture & Agricultural Experiment Station. R. A. Nichols, Dean and Dir.; Albert S. Curry, Assoc. Dir.; A. E. Triuiz, Assoc. Dir. of Extension Service; P. W. Cockerill, Asst. Dean Div. Instruction.

Sub-Stations:

Alcalde—
Espanola Valley Substation. Philip M. Turjillo, Supt.

Albuquerque—
Middle Rio Grande Substation: Route 3, Box 3460. H. D. Jones, Supt.

Clovis—
Plains Substation: Star Route. John Carter, Supt.

Tucumcari—
Northeastern Substation. D. H. Williams, Supt.

NEW YORK

Ithaca—
Cornell University, College of Agriculture & Agricultural Experiment Station. C. E. F. Guterma, Dir. of Res. & Dir. Station; A. W. Gibson, Dir. of Res. Instruction; M. C. Bond, Dir. Extension Service.

Geneva—
New York State Agricultural Ex-

periment Station. A. J. Heinicke, Dir.

Sub-Stations:

Farmingdale—

The Long Island Ornamentals Research Laboratory. Arthur Bing, in charge.

Riverhead, Long Island—

Long Island Vegetable Research Farm. S. L. Dallyn, in charge.

NORTH CAROLINA

Raleigh—

University of North Carolina, College of Agriculture and Agricultural Experiment Station. R. L. Lovvorn, Dir. of Research; W. A. Colwell, Asst. Dir. in Charge of Tobacco Research; H. A. Stewart, Asst. Dir.; D. S. Weaver, Dir. of Extension; C. B. Ratchford, Asst. Dir.; R. W. Shoffner, Asst. Dir.

Branch Stations:

Clayton—

Clayton Research Station: Box 303. W. S. Allsbrook, Asst. Dir. in charge.

Faison—

Coastal Plain Vegetable Research Farm: Box 247. Wm. W. Reid, in charge.

Greenville—

Lower Coastal Plain Tobacco Research Farm. Carroll Bennett, Supr.

Hendersonville—

Mountain Fruit and Vegetable Station. Frank Boyette, Supt.

Jackson Springs—

Peach Research Laboratory. Clarence Black, Supt.

Laurel Springs—

Upper Mountain Branch Station. Dana F. Tugman, Asst. Dir. in charge.

Lewiston—

Peanut Test Farm. C. Z. McSwain, Jr., Supt. in charge.

Oxford—

Tobacco Branch Station. J. M. Carr, Asst. Dir. in charge.

Plymouth—

Tidewater Branch Station. J. L. Rea, Sr., Asst. Dir. in charge.

Rocky Mount—

Upper Coastal Plain Branch Station. W. H. Bailey, Asst. Dir. in charge.

Rural Hall—

Upper Piedmont Tobacco Research Farm. Henry Marshall, in charge.

Statesville—

Upper Piedmont Branch Station. J. W. Hendricks, Asst. Dir. in charge.

Waynesville—

Mountain Branch Station. M. R. Whisenhunt, Asst. Dir. in charge.

Whiteville—

Border Belt Tobacco Research Farm. W. J. Dickens, Supr.

Willard—

Lower Coastal Plain Branch Station. J. W. Sumner, Asst. Dir. in charge.

Wilmington—

Vegetable Research Laboratory. J. M. Jenkins, Jr., in charge.

NORTH DAKOTA

Fargo—

State College Station, College of Agriculture and Agricultural Experiment Station. G. C. Holm,

Dean School of Agriculture and Dir., Agricultural Experiment Station; Arlon G. Hazen, Asst. to the Dir.; E. J. Haslerud, Dir. Agr. Extension Service.

Sub-Stations:

Casselton—

Agronomy Seed Farm. Mark Jendro, Mgr.

Dickinson—

Dickinson Agricultural Experiment Station. Raymond J. Douglas, Supt.

Edgeley—

Edgeley Sub-Experiment Station. Miles C. White, Supt.

Hettinger—

Hettinger Sub-Experiment Station. Leslie O. Williamson, Supt.

Langdon—

Langdon Sub-Experiment Station. Victor Sturlaugson, Supt.

Minot—

North Central Agricultural Experiment Station. G. N. Geiszler, Supt.

Williston—

Williston Experimental Substations (Dryland & Irrigation). Howard M. Olson, Supt.

OHIO

Columbus—

Ohio State University, College of Agriculture. L. L. Rummell, Dean, College of Agriculture; W. B. Wood, Dir. Agricultural Extension.

Wooster—

Ohio Agricultural Experiment Station. L. L. Rummell, Dir.; W. E. Krauss, Assoc. Dir.

Branch Stations:

Canfield—

Mahoning County Experiment Farm. Clifford A. Morrison, Mgr.

Carpenter—

Southeastern Sub-Station. Jno. P. Hamill, Farm Supt.

Castalia—

North Central Substation: R.F.D. 1, Vickery, Ohio. Robert L. Eby, Mgr.

Cincinnati—

Hamilton County Experiment Farm: R. R. 2, Box 75. W. L. Jones, Mgr.

Cortland—

Trumbull County Experiment Farm. James H. Foster, Mgr.

Hoytville—

Northwestern Substation. Donald E. Herr, Mgr.

London—

Madison County Experiment Farm. H. W. Rogers, Mgr.

Marietta—

Vegetable Crops Substation. H. M. Racer, Mgr.

St. Clairsville—

Belmont County Experiment Farm. H. R. McMahon, Mgr.

Willard—

Muck Crops Experiment Farm. Edward Postema, Mgr.

OKLAHOMA

Stillwater—

Oklahoma A. & M. College and Agricultural Experiment Station. A. E. Darlow, Dean; L. E. Hawkins, Dir. Experiment Station; Shawnee Brown, Dir. Extension Service.

Sub-Stations:

Altus—

Irrigation Experiment Station, Dudley Barefoot, Supt.

Bixby—

Oklahoma Vegetable Research Station, Charles Galeotti, Supt.

Blair—(P. O.: Lone Wolf)

Oklahoma Irrigation Experiment Station. Roy O. Ward, Supt.

Cherokee—

Wheat Land Conservation Experiment Station. Clifford C. Padgham, Foreman (USDA).

Chickasha—

Oklahoma Cotton Research Station. Edward S. Oswalt, Supt.

Coalgate—

Southeast Oklahoma Pasture Fertility Research Station. E. E. Miller, Foreman.

El Reno—

Ft. Reno Experiment Station. Dwight F. Stephens, Supt. (USDA).

Goodwell—

Panhandle Experiment Station. H. H. Finnell, Supt.

Guthrie—

Red Plains Conservation Experiment Station. Harley A. Daniel, Project Supvr. (USDA).

Heavener—

Soil and Pasture Station. C. L. Majors, Foreman.

Idabel—

Kiamichi Field Station. H. R. Hedger, Supt.

Mangum—

Sandy Land Research Station. Thomas S. Cunningham, Supt.

Pawhuska—

Veterinary Research Field Laboratory. Roscoe W. Martin, Foreman.

Sparks—

Oklahoma Pecan Research Station. Enoch D. Kenworthy, Supt.

Stillwell—

Eastern Oklahoma Field Station. John A. McGinnis, Supt.

Stefford—

Oklahoma Peanut Experiment Farm. W. N. Stokes, Foreman.

Tipton—

Southwest Oklahoma Cotton Station. C. L. Fox, Foreman.

Wilburton—

Range Cattle Minerals Station. Joe Kinnikin, Foreman.

Woodward—

U. S. Southern Great Plains Field Station. E. L. McIlwain, Supt. (USDA).

OREGON

Corvallis—

Oregon State College, School of Agriculture & Agricultural Experiment Station. F. E. Price, Dean and Dir. Agricultural Experiment Station; F. E. Price, Dir. Agricultural Extension Service; F. L. Ballard, Assoc. Dir.

Branch Stations:

Astoria—

John Jacob Astor Branch Station: Rt. 1, Box 921. H. B. Howell, Supt.; W. E. Dent, Asst. Supt.

Burns—

Squaw Butte-Harney Experiment Station: P. O. Box 833. W. A. Sawyer, Supt.

Hermiston—
Umatilla Branch Experiment Station: Box 965. C. A. Larson, Supt.

Hood River—
Mid-Columbia Branch Experiment Station: P. O. Box 89. W. M. Melenthin, Supt.

Klamath Falls—
Klamath Experimental Area: Box 448. A. E. Gross, Supt.

Medford—
Southern Oregon Branch Experiment Station: 5595 Pacific Highway South. H. H. White, Supt.

Milton-Freewater—
Milton-Freewater Experimental Area. C. A. Larson, Supt. (Umatilla Br. Exp. Sta., P. O. Box 965, Hermiston).

Moro—
Sherman Branch Experiment Station. W. A. Hall, Acting Supt.

Ontario—
Malheur Experimental Area: Rt. 1, Box 238. E. N. Hoffman, Supt.

Oregon City—
Red Soils Experimental Area. J. T. McDermid, Supt.

Pendleton—
Pendleton Branch Experiment Station: Box 816. M. M. Oveson, Supt.

Redmond—
Central Oregon Experimental Project: Box 1215. M. J. Johnson, Area Supt.

Union—
Eastern Oregon Livestock Branch Experiment Station. H. G. Avery, Supt.

PENNSYLVANIA

University Park—
The Pennsylvania State University College of Agriculture & Agricultural Experiment Station. L. E. Jackson, Dean College of Agriculture; M. A. Farrell, Assoc. Dean & Dir. of Station; H. R. Albrecht, Assoc. Dean & Dir. of Agricultural Extension; R. B. Dickerson, Assoc. Dean & Dir. of Resident Instruction.

RHODE ISLAND

Kingston—
University of Rhode Island, College of Agriculture, Agricultural Experiment Station & Extension Service. Mason H. Campbell, Dean and Dir.; Everett P. Christopher, Vice-Dean of the College; Wm. H. Wiley, Assoc. Dir. of the Experiment Station; Prof. Homer O. Stuart, Dir. Extension Service.

SOUTH CAROLINA

Clemson—
Clemson Agricultural College, Agricultural Experiment Station & Extension Service. M. D. Farrar, Dean School of Agriculture; J. W. Jones, Dir. of Agricultural Teaching; O. B. Garrison, Dir. Experiment Station; George H. Nutt, Dir. Extension Service.

Sub-Stations:

Blackville—
Edisto Experiment Station. W. B. Rogers, Supt.

Charleston—
Truck Experiment Station: P. O.

Box 158. W. C. Barnes, Supt.

Columbia—
Sandhill Experiment Station: Route 3. W. H. Rhodes, Supt.

Florence—
Pee Dee Experiment Station. E. E. Hall, Supt.

Summerville—
Clemson Coast Experiment Station. E. D. Kyzer, Supt.

SOUTH DAKOTA

Brookings—
South Dakota State College of Agriculture & Agricultural Experiment Station. I. B. Johnson, Dir.; G. I. Gilbertson, Dir. Extension Service.

Sub-Stations:

Buffalo—
Antelope Range Substation. W. H. Trevillyan, Supt.

Cottonwood—
Range Field Station. Frank Whetzel, Supt.

Eureka—
North Central Substation. Albert Dittman, Supt.

Highmore—
Central Substation. Wade R. Pringle, Supt.

Newell—
U. S. Newell Field Station. Harry E. Weakley, Supt.

Presho—
Reed Ranch. J. D. Rahn, Supt.

TENNESSEE

Knoxville—
University of Tennessee, College of Agriculture & Agricultural Experiment Station. J. H. McLeod, Dean College of Agriculture, Dir. of Experiment Station, Dir. Extension; F. S. Chance, Vice Dir. of Sta.; N. D. Peacock, Vice Dean, College of Agric.; Jno. A. Ewing, Asst. Dir., Experiment Station; R. W. Moore, Vice Dir. of Extension Service; E. C. McReynolds, Assoc. Dir. of Extension Service.

Sub-Stations:

Crossville—
Plateau Experiment Station. John A. Odom, Supt.

Greeneville—
Tobacco Experiment Station. J. Hugh Felts, Supt.

Jackson—
West Tennessee Experiment Station. Ben P. Hazelwood, Supt.

Lewisburg—
Dairy Experiment Station. A. G. Van Horn, Supt.

Oak Ridge—
UT-AEC Agricultural Research Program. Dr. Homer Patrick, Lab. Director & Research Co-ordinator; J. Merrill Bird, Farm Supt.

Spring Hill—
Middle Tennessee Experiment Station. E. J. Chapman, Supt.

Springfield—
Highland Rim Experiment Station. Lawson M. Safley, Supt.

TEXAS

College Station—
Agricultural & Mechanical Col-

lege of Texas, Agricultural Experiment Station and Extension Service. R. D. Lewis, Dir.; R. E. Patterson, Vice Dir.; G. G. Gibson, Dir. Extension Service; T. D. Pre-wit, Assoc. Dir. Extension Service; W. N. Williamson, Asst. Dir. Extension Service.

Sub-Stations:

Angleton—
James C. Smith, Supt.

Beaumont—
Rice-Pasture Experiment Station: Route 5, Box 366. W. C. Davis, Supt.

Beeville—
Box 871. Robert A. Hall, Supt.

Chillicothe—
J. Roy Quinby, Supt.

Crystal City—
Bruce A. Perry, Supt.

Denton—
Route #1, Box 547. Daniel I. Dudley, Supt.

Gonzales—
A. A. Camp, Supt.

Iowa Park—
Lester E. Brooks, Supt.

Kirbyville—
J. R. Wood, Supt.

Lubbock—
Rt. 8. Donald L. Jones, Supt.

McGregor—
Box 567. Henry O. Hill, Supt.

Nacogdoches—
Howard C. Hutson, Supt.

Prairie View—
J. C. Williams, Supt.

Sonora—
Wm. T. Hardy, Acting Supt.

Stephenville—
Bryon C. Langley, Supt.

Spur—
Charles E. Fisher, Supt.

Temple—
Richard M. Smith, Supt.

Tyler—
Route 5. Paul R. Johnson, Supt.

Weslaco—
Box 537. Walter R. Cowley, Supt.

Ysleta—
Rt. 1, Box 66. Paul J. Lyerly, Supt.

Field Laboratories:

Gilmer—
Lester C. Alley, in charge.

Jacksonville—
P. A. Young, in charge.

Lufkin—
E. K. Crouch, in charge.

Montague—
U. A. Randolph, in charge.

Mt. Pleasant—
Mark Buckingham, in charge.

Panhandle—
F. A. Sims, Assoc. Veterinarian.

Yoakum—
A. L. Harrison, in charge.

Cooperating Stations:

Big Springs—
F. F. Keating, Supt.

Brownwood—
L. D. Romberg, in charge.

Bushland—
C. E. Van Doren, Supt.

Greenville—
Don Porter, Supt.

Riesel—

R. W. Baird, Project Supervisor

UTAH**Logan—**

Utah State Agricultural College, Agricultural Experiment Station and Extension Service. R. H. Walker, Dean and Dir. Agricultural Sciences; D. W. Thorne, Dir., Experiment Station; Carl Frischknecht, Dir. Agricultural Extension Service; D. A. Burgoyne, Asst. Dir. Experiment Sta.; G. A. Carpenter and M. Broadbent, Asst. Dir. Extension Service.

VERMONT**Burlington—**

University of Vermont, College of Agriculture and Home Economics, and Agricultural Experiment Station. J. E. Carrigan, Dean, Dir. of Experiment Station and Extension Service; P. R. Miller, Assoc. Dean and Assoc. Dir. of Experiment Station and Extension Service; R. P. Davison, Assoc. Dir. of Extension Service.

Sub-Stations**Middlebury—**

Morgan Horse Farm. J. E. Carrigan, Dir., Lucien D. Paquette, Supt.

VIRGINIA**Blacksburg—**

Virginia Polytechnic Institute and Agricultural Experiment Station. H. N. Young, Dir.; W. B. Bell, Assoc. Dir. Agricultural Experiment Station; L. B. Dietrick, Dir. Extension Service and Dean of Agriculture; W. H. Daughtrey, Assoc. Dir.

Norfolk—

Virginia Truck Experiment Station. Wm. H. Brittingham, Dir.

Onley—

Eastern Shore Substation. E. M. Dunton, Jr., in charge.

Sub-Stations:**Accomac—(P. O.: Onley)**

Eastern Shore Branch, Virginia Truck Experiment Station. L. T. Chandler, Supt.

Chatham—

Bright Tobacco Field Station. W. A. Jenkins, Plant Pathologist; E. M. Matthews, Assoc. Agronomist.

Charlotte Court House—

Southside Field Station. R. D. Sears, Supt.

Front Royal—

Beef Cattle Research Station. B. M. Priode, Supt.

Glade Spring—

Southwest Virginia Field Station. F. S. McClaugherty, Supt.

Holland—

Tidewater Field Station. H. Marshall Clark, Supt.

Middleburg—

Northern Virginia Pasture Research Station. H. T. Bryant, Supt.

Orange—

Piedmont Field Station. G. D. Jones, Supt.

Petersburg—

Virginia State College Field Station. M. T. Carter, Supt.

Staunton—

Shenandoah Valley Field Station. P. T. Gish, Supt.

Warsaw—

Eastern Virginia Field Station. H. M. Camper, Jr., Supt.

WEST VIRGINIA**Morgantown—**

West Virginia University, College of Agriculture and Agricultural Experiment Station. H. R. Varney, Dir. Agricultural Experiment Station; A. H. VanLandingham, Asst. Dir. Agricultural Experiment Station; J. O. Knapp, Dir. Agricultural Extension Service; Herman M. Bowers, Asst. Dir. Agricultural Extension Service.

Sub-Stations:**Kearneysville—**

University Experiment Farm. Edwin Gould, Supt.

Point Pleasant—

Ohio Valley Substation. D. R. Browning, Supt.

Reedsville—(P. O.: Morgantown)

Reedsville Experiment Farm. K. C. Westover, Supt.

Wardensville—

Reymann Memorial Farms. C. J. Cunningham, Supt.

WASHINGTON**Pullman—**

State College of Washington, Institute of Agricultural Sciences. J. C. Knott, Dir.; M. T. Buchanan, Dir. Agricultural Experiment Station; S. P. Swenson, Dean, College of Agriculture; R. M. Turner, Dir. of Extension Service.

Lind—

Dry Land Experiment Station. Walter L. Nelson, Supt.

Long Beach—

Cranberry, Blueberry Experiment Station. Charles C. Doughty, Acting Supt.

Mount Vernon—

Northwestern Washington Experiment Station. Martin W. Carstens, Supt.

Prosser—

Irrigation Experiment Station. H. P. Singleton, Supt.

Puyallup—

Western Washington Experiment Station. D. F. Allmendinger, Supt.

Vancouver—

Southwestern Washington Experiment Station. R. M. Bullock, Supt.

Wenatchee—

Tree Fruit Experiment Station. Archie Van Doren, Supt.

WISCONSIN**Madison—**

University of Wisconsin, College of Agriculture and Agricultural Experiment Station. R. K. Froker, Dean College, Dir. Station, Dir. Extension Service; Noble Clark, Assoc. Dir. of Station; H. L. Ahlgren, Assoc. Dir. Extension Service.

Sub-Stations:**Ashland—**

Branch Experiment Station. Garit Tenpas, Supt.

Coddington—

Branch Experiment Station. Theodore Jensen, Supt.

Hancock—

Brand Experiment Station. Myron D. Groskopf, Supt.

LaCrosse—

Upper Mississippi Erosion Station (Coop. USDA). O. E. Hays, Supt.

Lake Mills—

Emmons Blaine, Jr., Experimental Farm. J. Warren Deppe, Supt.

Marshfield—

Branch Experiment Station. Russell Johannes, Supt.

Spooner—

Branch Experiment Station. A. M. Strommen, Supt.

Sturgeon Bay—

Peninsular Branch Experiment Station. F. A. Gilbert, Supt.

WYOMING**Laramie—**

University of Wyoming, College of Agriculture and Agricultural Experiment Station. H. M. Briggs, Dean Col. of Agr., Dir. of Station; George Bridgmon, Asst. Dir. in charge of substations; G. H. Starr, Dir. of Extension.

Sub-Stations:**Afton—**

Afton Substation. R. J. Hyer, Supt.

Archer—

Archer Substation: Route #1, Box 1374, Cheyenne. Dale B. Fritz, Supt.

Gillette—

Gillette Substation. Leland L. Landers, Supt.

Powell—

Powell Substation: P. O. Box 767, Warren L. Smith, Supt.

Sheridan—

Sheridan Substation: Box 879, O. K. Barnes, Supt.

Torrington—

Torrington Substation, L. H. Paules, Supt.

ALASKA**College—**

University of Alaska. Allen H. Mick, Dean of Agriculture, Dir. of Extension, Assoc. Dir. of Experiment Station; Arthur S. Buswell, Assoc. Dir. Extension Service.

Fairbanks—

Fairbanks Experiment Farm. E. G. Osguthorpe, Mgr.

Matanuska—

Matanuska Experiment Farm. Harold Gershmel, Foreman.

Palmer—

Alaska Agricultural Experiment Station. Don L. Irwin, Dir.; Emil G. Ganschow, Adm. Officer.

Petersburg—

Petersburg Experiment Fur Station. James R. Leekley, Biologist-in-charge.

PUERTO RICO**Rio Piedras—**

University of Puerto Rico, Agricultural Experiment Station. Arturo Roque, Dir.; B. G. Capo, Assoc. Dir. for Research; R. Huyke, Dir., Agricultural Extension Service; A. Perez, Vice-Dir.

Mayaguez—

University of Puerto Rico College of Agriculture. L. Stefani, Vice-Chancellor.

Branch Stations:**Adjuntas—**

Coffee Agricultural Experiment Substation and Seed Farm. Saulo J. Rodriguez, Research Asst. in Horticulture in charge (Acting).

Corozal—
Corozal Agricultural Experiment Substation and Seed Farm. Hector Gandia, Assoc. Agronomist in charge.

Gurabo—
Tobacco Agricultural Experiment Substation and Seed Farm. A. Amy, Assoc. Agronomist in charge.

Isabela—
Isabela Agricultural Experiment Substation. A. Riollano, Agronomist in charge.
Isabela Seed Farm. M. Aviles, Assoc. Agronomist in charge.

Lajas—
Lajas Agricultural Experiment Substation and Seed Farm. A. Gonzalez-Chapel, Assoc. Animal Husbandman in charge.

CANADA

Experimental Farms Service. Head Office — Central Experimental Farm Ottawa, Ontario. Dr. C. H. Goulden, Dir.; Dr. J. C. Woodward, Assoc. Dir.

Branch Farms:

Agassiz, B. C.—
Experimental Farm. M. F. Clarke, Supt.

Beaverlodge, Alta.—
Experimental Farm. E. C. Stacey, Supt.

Brandon, Man.—
Experimental Farm. R. M. Hooper, Supt.

Caplan, Que.—
Experimental Substation. L. J. Bellefleur, Supt.

Charlottetown, P. E. I.—
Experimental Farm. R. C. Parent, Supt.

Delhi, Ont.—
Tobacco Substation. L. S. Vickery, Officer-in-charge.

Fort Simpson, N. W. T.—
Experimental Farm. J. A. Gilbey, Supt.

Fort Vermilion, Alta.—
Experimental Farm. V. J. Lowe, Officer-in-charge.

Fredericton, N. B.—
Experimental Farm. S. A. Hilton, Supt.

Harrow, Ont.—
Experimental Farm. H. F. Murwin, Supt.

Indian Head, Sask.—
Experimental Farm. J. Roe Foster, Supt. Forestry Nursery Station. J. Walker, Supt.

Kamloops, B. C.—
Range Experiment Station. T. G. Willis, Supt.

Kapuskasing, Ont.—
Experimental Farm. F. X. Gosselin, Supt.

Kentville, N. S.—
Experimental Farm. C. J. Bishop, Supt.

Lacombe, Alta.—
Experimental Farm. G. E. DeLong, Supt.

L'Assomption, Que.—
Experimental Farm. R. Bordeleau, Supt.

Lennoxville, Que.—
Experimental Farm. E. Mercier, Supt.

Leithbridge, Alta.—
Experimental Farm. H. Chester, Supt.

Manyberries, Alta.—

Range Experiment Station. H. F. Peters, Supt.

Melfort, Sask.—
Experimental Farm. H. E. Wilson, Supt.

Morden, Man.—
Experimental Farm. W. R. Leslie, Supt.

Nappan, N. S.—
Experimental Farm. S. B. Williams, Supt.

Normandin, Que.—
Experimental Farm. J. A. Belzile, Supt.

Prince George, B. C.—
Experimental Farm. W. T. Burns, Supt.

Regina, Sask.—
Experimental Farm. H. W. Leggett, Supt.

Saanichton, B. C.—
Experimental Farm. J. J. Woods, Supt.

Sie. Anne De La Pocatiere, Que.—
Experimental Farm. J. R. Pelletier, Supt.

St. John's West, Nfld.—
Experimental Farm. I. J. Green, Supt.

Saskatoon, Sask.—
Forage Plants Laboratory. W. J. White, Officer-in-charge.

Scott, Sask.—
Experimental Farm. G. D. Matthews, Supt.

Smithers, B. C.—
Experimental Farm. R. G. Savage, Supt.

Summerland, B. C.—
Experimental Farm. T. H. Anstey, Supt.

Summerside, P. E. I.—
Experimental Fur Ranch. C. K. Gunn, Supt.

Sutherland, Sask.—
Forest Nursery Station. W. L. Kerr, Supt.

Swift Current, Sask.—
Experimental Farm. G. N. Denike, Supt.
Soil Research Laboratory. J. L. Doughty, Officer-in-charge.

Winnipeg, Man.—
Cereal Breeding Laboratory. R. F. Peterson, Officer-in-charge.

Whitehorse, Y. T.—
Experimental Farm. J. W. Abbott, Officer-in-charge.

Survey of Fertilizer-Pesticide Mixtures used on Food Crops

Conducted By

RODNEY C. BERRY

Virginia State Chemist

Notes refer to numbered questions in questionnaire.

Alabama: 1, 7—Aldrin, Dieldrin, DDT, Chlordane. 10—Regulations are now being considered, probably will be promulgated and put into effect in 1955. 16, 17—These mixtures are permitted upon written order signed by purchaser, with complete formula, tonnage, name and address of purchaser—must be labeled. 20—Have had no requests for mixtures containing pesticides and lime or pesticide and gypsum.

Arizona: 7—DDT for lawn use only. 11, 12—Problem has not come up to date, but would not permit use of woven bags. 13—Those sold for lawn use packaged in paper bags. 20—If materials appeared to be compatible, they would have to be accepted. 21—New laws HB-147 and MB-143 governing these materials passed by Legislature in 1955, effective January 1, 1956. Regulations covering fertilizer-pesticide mixtures will be in order after effective date of new law.

Arkansas: 1—Some is being used on an experimental basis by individuals.

As yet, we have not received an application for sale of these mixtures. Comments: We are filling out this questionnaire giving answers as to how we think these mixtures would be regarded by us. 6—Only tonnage tax. 7—Aldrin—for control of Rice Field Mosquito and Rice Water Weevil. 8—No recommendations have been made as yet. 9—Would possibly limit to recommendations. 11—Probably would under certain conditions. 12—Probably would. 13—Probably would not. 20—Would if approved by Federal Insecticide, Fungicide and Rodenticide Act.

California: 7—Aldrin and Dieldrin. Comments: We apply all the requirements of the pesticide law and the fertilizer law to these mixtures just the same as if they were separate items. Have had no difficulty so far.

Colorado: 7—Aldrin, Dieldrin and Chlordane. 11, 12, 13—Question has not come up. 17—Would be if permitted. 18—Fertilizer, yes. Comments: Fertilizer-Pesticide Mixtures are considered and treated separately by Colorado Department of Agricul-

ture.

Connecticut: 3, 4, 5—Registration is not required under Pesticide Law. 7—DDT only. 14—Ingredient statement only. 20 — Question has not come up.

Delaware: 7—No Regulations. 18—Fertilizer only.

Florida: 7—Aldrin, Chlordane, DDT predominate. 12, 13—We have not specified the kind of bag. 15—Yellow Tag required. 16—All such mixtures

are made on special order. 20—No restrictions on such mixtures if in accordance with Tech. Reg. #5. **Comments:** Tech. Regulation #5 specifies pesticides which may be mixed with fertilizers and regulates conditions

QUESTIONS

Does your State have a Fertilizer Law?

Does your State have a Pesticide Law?

- Are Fertilizer-Pesticide Mixtures sold in your State?
- Are these mixtures registered under your Fertilizer Law?
- Do you have a law regulating Pesticides?
- Are these mixtures registered under your Pesticide Law?
- Do you collect the regular fee under your Pesticide Law?
- Do you collect the regular fee and tonnage tax under your Fertilizer Law?
- Name the pesticides which are generally used in these mixtures in your State.
- Does your State Experiment Station recommend fertilizer-pesticide mixtures?
- Do you limit registration and distribution of fertilizer-pesticide mixtures to those mixtures recommended by the State Experiment station.
- Have you issued regulations covering the sale and distribution of these mixtures?
- Do you permit sale in bulk?

12. Do you permit sale in woven bags?

13. Do you require that mixtures be distributed in heavy paper containers?

14. Do you require a label showing:

(a) Ingredient statement for both fertilizer and pesticide?

(b) Directions for use?

(c) Warning statement.

(d) Other requirements under both laws.

15. In addition to the above label, do you require a Red Tag bearing a warning or other statement?

16. Do you permit "Buyers Mixtures" or "Farmers Mixtures" whereby a farmer may have any pesticide added to his fertilizer by the manufacturer?

17. Are sales under 16 above subject to regulation under Fertilizer and Pesticide Laws?

18. Do you analyze fertilizer-pesticide mixtures?

19. Have you established tolerances for deficiency or excess of pesticide?

20. Do you permit the sale of lime or gypsum mixed with pesticides?

21. Are changes in your laws now being considered?

ANSWERS

STATE	Fert. Law?	Pest. Law?	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14a.	14b.	14c.	14d.	15.	16.	17.	18.	19.	20.	21.
Alabama	Yes	Yes	Yes*	Yes	Yes	Yes	Yes	Yes	No*	Yes	Yes	No*	No	—	—	Yes	Yes	Yes	—	No	Yes*	—*	No	No	No*	—
Arizona	Yes	Yes	Yes*	Yes	Yes	Yes	Yes	Yes	Yes*	No	No	No	No*	No*	No*	Yes	Yes	Yes	—	No	No	Yes	Yes	Yes	Yes*	Yes*
Arkansas	Yes	Yes	No*	Yes	Yes	Yes	Yes	Yes*	No*	No*	Yes*	No	Yes*	Yes*	No*	Yes	Yes	Yes	—	No	Yes	Yes	No	No	Yes*	No
California	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No
Colorado	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	No	No	No	No*	Yes*	Yes*	Yes	Yes	Yes	Yes	Yes	No	Yes*	Yes*	No	No	No
Connecticut	Yes	Yes	Yes	Yes	Yes*	No*	No*	Yes	Yes*	No	No	No	Yes	Yes	No	Yes	No	No	—*	No	Yes	No	Yes	No	No*	Yes
Delaware	Yes	No	Yes	Yes	No	—	—	Yes	Yes*	No	No	No	Yes	Yes	No	No	—	—	—	No	Yes	No	Yes*	No	Yes	Yes
Florida	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes*	No	No	Yes	No	No*	No*	Yes	No	Yes	—	Yes*	Yes*	Yes	Yes	No	No*	No
Georgia	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	No	No	Yes*	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No	No
Idaho	Yes	No	Yes	No	No	No	No	Yes	Yes*	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	Yes	No	Yes	No	Yes	No
Illinois	Yes	No	Yes	Yes	No	No	No	Yes	Yes*	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	No
Indiana	Yes	No	Yes	Yes	No	No	No	Yes	Yes*	Yes	Yes	Yes	Yes	—	No	Yes	Yes	Yes	—	Yes	Yes	Yes	Yes*	No	No*	No
Iowa	Yes	Yes	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Kansas	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	Yes	Yes	No	No	No	No*	Yes	Yes	Yes	—	No	No	Yes	Yes	No	No	No
Kentucky	Yes	No*	Yes	Yes	No	No	No	Yes	Yes*	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	—	No	Yes	Yes	Yes*	No	No*	No
Louisiana	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	No	No	No	No*	No*	Yes	Yes	Yes	Yes	Yes	No	No*	Yes	Yes	No	No*	No
Maine	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes*	No
Maryland	Yes	Yes	Yes	Yes	Yes*	Yes*	Yes	Yes	Yes*	No	No*	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes*	Yes
Massachusetts	Yes	No	Yes	Yes	No	—	—	Yes	Yes*	No*	No*	No	No*	No*	No*	No	No	No	No	No	Yes	No	Yes	No	—	Yes*
Michigan	Yes	Yes	Yes	Yes	Yes*	Yes*	Yes	Yes	Yes*	Yes	Yes	Yes*	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	—	Yes	No	No	No
Minnesota	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	Yes	No	Yes	Yes	Yes*	No*	Yes	Yes	Yes	—	No	Yes*	Yes	Yes	No	Yes*	No
Mississippi	Yes	Yes	No*	Yes	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Missouri	Yes	No	Yes	Yes*	No	No	No	Yes	Yes*	No	No	No	Yes	Yes	No	—	—	—	—	No	Yes	Yes	Yes	No	Yes	Yes*
Montana	Yes	Yes	No	Yes	Yes	No	No	Yes	No*	No	No	No	—	—	—	Yes	Yes	Yes	—	No	Yes	No	No	No	—	No
Nebraska	Yes	No	Yes	Yes	No	No	No	Yes	Yes*	—	—	No	Yes	Yes	—	No	Yes*	No	—*	No	Yes	No	No	No	Yes	No
Nevada	No	No	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
New Hampshire	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	Yes	No	No	Yes	Yes	No	Yes	Yes	No	—	No*	Yes	Yes	Yes*	No	Yes	Yes
New Jersey	Yes	Yes	No*	Yes	Yes	Yes	Yes	Yes	—	No*	No*	No	No*	No*	No*	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes*	No*	No	No
New Mexico	Yes	Yes	No*	Yes	Yes	Yes	Yes	Yes	Yes*	No	Yes	No	No	—	—	Yes	Yes	Yes	—	No	No	—	Yes	No	No	No
New York	Yes	Yes	No	Yes*	Yes	No*	No	Yes	Yes*	No*	No	No	Yes*	Yes*	Yes*	Yes	Yes	Yes	—	No	—	Yes	Yes	No	—	—
North Carolina	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes*	No*	No*	Yes*	Yes*	No*	No*	Yes	—	Yes	—	Yes	Yes*	Yes*	Yes	No*	Yes*	No*
North Dakota	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	No*	Yes	No	—	—	Yes	Yes	Yes	Yes	Yes	No	Yes	No	—	No	—	No
Ohio	Yes	No	Yes	Yes	No	No*	No	Yes	Yes*	No*	No	No	Yes	Yes	No	No	No	No	—	No	Yes	No	No	No	Yes	No
Oklahoma	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	No*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oregon	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	Yes	No	No	Yes	Yes	No	Yes	—	Yes	—	No	Yes	Yes*	Yes	No	Yes	Yes
Pennsylvania	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	Yes	No	No	Yes	Yes	No	Yes	—	Yes	—	Yes	Yes	No	Yes*	No	Yes	No
Rhode Island	Yes	Yes	No*	Yes	Yes	Yes	Yes	Yes	Yes*	—	—	—	Yes*	Yes	No	Yes	Yes	Yes	—	No	Yes*	No*	Yes*	No	Yes*	No
South Carolina	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes*	Yes	No*	Yes	Yes	No	No	Yes	Yes	Yes	—	Yes*	Yes	Yes	Yes	No	No*	No
South Dakota	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	—	No	No	No	No*	No	No	Yes
Tennessee	Yes	Yes	Yes*	Yes	Yes	Yes	Yes	Yes	Yes*	Yes	Yes	No	No	No	No	Yes	Yes	Yes	—	No	Yes	Yes	No	No	Yes	—
Texas	Yes	Yes	No*	—	Yes	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Utah	Yes	Yes	No*	Yes*	Yes	Yes*	Yes*	—	No	No*	Yes*	Yes*	Yes*	No*	Yes	—	Yes	—	—	No	No	—	Yes	No	No	No
Vermont	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	—	No	Yes	Yes	Yes	No	—	No
Virginia	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	Yes*	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	No	—	Yes	Yes	No	No
Washington	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	Yes	No	No	No	Yes	No	Yes	Yes	Yes	Yes	No	No*	Yes	Yes	No	Yes	Yes*
West Virginia	Yes	No	Yes	Yes	No	—	—	Yes	Yes*	No	No	No	Yes	Yes	No	No	No	No	No	No	Yes	Yes	Yes*	No	Yes	No
Wisconsin	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	Yes	No	No	Yes	—	—	Yes	Yes	Yes	—	No	Yes	Yes*	Yes*	No	No*	No
Wyoming	Yes	Yes	No*	Yes*	Yes	Yes*	Yes*	—	No	—	No	—	—	—	—	Yes	Yes	Yes	Yes	No	No	Yes	No	No	—	No
Hawaii	No	Yes	Yes	No	Yes	Yes	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No	No
Puerto Rico	Yes	Yes	Yes	Yes	Yes*	No	Yes	Yes*	No*	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	—	Yes*	No*	No*	Yes	No	No*	No*
Canada	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes*	Yes*	No*	No	No	No	Yes*	Yes*	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes*	—	No*

*Refer to state heading in text of article for detailed information, explanation or comment.

of sale, percentage, use, storage and distribution. "Fertilizers containing pesticides may be made only on special order for prompt use and may not be stocked (except for use on lawns, turf and ornamentals)."

Georgia: 7—Aldrin, Chlordane, DDT. 10—Regulations 3-2-55, Sec. 2—Field Crop Fertilizers with pesticides, (Food, Forage, Fiber and Tobacco formulations) may contain those organic pesticides that are known not to effect flavor or are incapable of translocation so as to transmit residues, and may be sold without restriction as to area or package size, except that there be no bulk sales or deliveries of these mixtures. All packages must be fully labeled showing both the fertilizer and the pesticide guarantees, and must be in conformation with both laws. All labels must be acceptable under the Georgia Economic Poisons Act and the Federal Insecticide, Fungicide and Rodenticide Act. Dual registration under the Georgia Fertilizer Law and the Georgia Economic Poisons Act is required.

Idaho: 7—DDT, Aldrin, Chlordane. **Illinois:** 7—Aldrin, Boron.

Indiana: 7—Aldrin, Dieldrin, Lindane. 10—Analyze as fertilizer only at present but are preparing to analyze for pesticides. 20—No control. Indiana does not have a Pesticide Law, however, such mixtures are regulated under Indiana Fertilizer Law. Items must be labeled to show ingredient percent, and bear caution and direction statement similar to requirements of the Model Pesticide Law. Labeling directions issued January 1955.

Iowa: No report.

Kansas: 7—Aldrin. 13—Recommended, not required.

Kentucky: 2—Note: Fertilizer-Pesticide Mixtures must be labeled as directed by Kentucky Experiment Station, showing percent of pesticide, directions for use and a caution or warning statement before permit is issued. 7—Aldrin, Chlordane. 10—Analyze fertilizer only. 20—Question never raised.

Louisiana: 7—Aldrin. 11, 12—Question has not come up. We will probably require paper bags. 16—Pesticide Law requirements would apply. 20—Pesticide Law requirements would apply.

Maine: 7—Registration permitted on grades recommended by the Maine Experiment Station. 20—No requests.

Maryland: 3, 4 — Note: Fertilizer-Pesticides must meet all requirements of both the Fertilizer Law and the Pesticide Law. Must be registered under both laws. 7—Aldrin. 9—

Experiment Station approves application before registration. 20—These have in the past been acceptable i.e. bordeaux mixtures, etc., however, the newer pesticides introduce problems not encountered heretofore. Therefore, each application is considered on its merits. We have not had the question up for discussion currently.

Massachusetts: 7—2,4-D, Chlordane. 8, 9—Very limited sale of fertilizer-pesticide mixtures. Experiment Station so far has recommended neither for nor against the use of such mixtures. 11, 12, 13 — These mixtures have been distributed in heavy paper sacks, but we have no requirements to this effect. 21—Yes, but not for immediate future.

Michigan: 3, 4—Note: Mixtures subject to all requirements of both Fertilizer and Pesticide Laws. Must be registered under both laws. 7—Aldrin and Chlordane (only). 10 — Regulations permitting the use of fertilizer-pesticide mixtures were adopted March 14, 1955, and the plan for these mixtures, under the regulations, is just beginning to materialize. Regulations are in close accord to Virginia Regulations.

Minnesota: 7—Aldrin, Dieldrin, Heptachlor and Chlordane. 12 — These mixtures have never been offered for sale in such containers. 13—No regulation requiring paper containers, however, such containers in common use. 16—Yes, if registered. 19—None registered.

Mississippi: Dr. M. P. Etheredge gave the following information: No Fertilizer-Pesticide mixtures used in Mississippi so far. One application for use of a Fertilizer-Pesticide Mixture was presented; the State Plant Board stated that the application was acceptable, however, the company has not completed registration. Dr. Etheredge did not state that this mixture was intended for use on food crops. If these combination materials are used, regulations under existing fertilizer and pesticide laws will be established.

Missouri: 2—The Missouri Fertilizer Law requires Company registration, but does not require brand or grade registration. 7—Aldrin, Chlordane. 14— (a) (b) (c)—Recommended but not required for pesticides. 21—A pesticide bill is now before our legislature.

Montana: 7—None sold in this state. 14 (d)—We accept Federal Label.

Nebraska: 7—Aldrin only and volume sold is very small. 14—The label shall state "name of Fertilizer with Aldrin"—% of aldrin and purpose for its use.

Nevada: No report.

New Hampshire: 7—2,4-D. 15—We feel that a red tag should be required. 18—Plant food only.

New Jersey: 1—None for Food Crop Use. 8, 9—None recommended. The Experiment Station feels this is not the proper way to control pests. The few mixtures registered have been handled as Special Mixtures, and are for use on lawns, parks and golf courses. 11, 12, 13—No regulations. 18—Have made attempts to analyze pesticides in mixtures. 19—No requests. Comment: Very little interest in these mixtures in New Jersey.

New Mexico: 1, 7—No Fertilizer-Pesticide Mixtures for use on food crops sold in New Mexico. We register these mixtures for use on lawns and ornamentals.

New York: 2—Pesticides are not required to be registered under N. Y. Pesticide Law if they are registered under Federal Act. We do require that they be registered as a fertilizer and properly labeled. 7—Chlordane. 8—No comment. 11, 12, 13—Question has not arisen, generally sold in paper bags.

North Carolina: 7—Chlordane, Aldrin, Dieldrin, Heptachlor, Toxaphene and DDT. 8—The Experiment Station neither recommends nor opposes fertilizer-Pesticide mixtures. Among the reasons for this are that the most effective application of pesticides to soil generally is by broadcasting while fertilizers are more often applied in the rows. Under varying conditions, satisfactory rates of application of the two when mixed becomes a rather acute problem. 9—The Experiment Station does not recommend any fertilizer-pesticide mixture, however, acceptance for registration under the North Carolina Law would not be extended beyond the six items listed under question 7 above, which represents those that have been qualified as permissible in fertilizer-pesticide mixtures. 10—North Carolina Regulations 8-36.1 and 8-36.2. 11—Question of the sale in bulk of fertilizer-pesticide mixtures has not arisen, however, there is no prohibition against it. 12—Sale of fertilizer-pesticide mixtures in woven or fabric bags has not been specifically prohibited, however, recommendations would be against it. Failure to heed such recommendations would dictate possible withdrawal of registration or promulgation of regulation. 13—Heavy paper containers are not required in the distribution of fertilizer-pesticide mixtures, however, no package which permitted leakage or dusting out of these mixtures would be considered accept-

able. 14 (d)—All the requirements of the fertilizer law, also requirements for fertilizer-pesticide mixtures as given in regulations apply. 16—"Buyers" or "Farmers" mixtures present the same old problems, whether only fertilizers or fertilizer-pesticide mixtures. These would not be recommended nor encouraged; however, there is no prohibition or law against them. 17—Circumstances would have a large bearing on the application of the fertilizer law to special mixes. No practical method of setting up exact lines of demarcation has yet been forthcoming. 19—Tentatively and subject to revision, tolerances as for pesticides are followed. 20—Question regarding the sale of pesticides mixed with lime or gypsum has not arisen here. Upon arising, such mixtures apparently would not be subject to the same considerations given to fertilizer-pesticide mixtures in the regulations. 21—Need for changes being studied.

North Dakota: 7—Chlordane, 2,4-D. 8—Sales of fertilizer-pesticide mixtures in North Dakota is extremely small. Mostly products for use on lawns to add fertilizer and control weeds at the same time. One company has a product registered to use when transplanting plants. A fertilizer mixture with chlordane for cut worm control. Quantity of such materials sold is very small. We have no actual figures. We try to follow a policy in keeping with the following statement of the State Experiment Station. "The use of insecticide-fertilizer combinations involves two problems: (1) the selection of the insecticide and the rate of application necessary to do a specific job and (2) the selection of the specific fertilizer formula and rate of application necessary to fulfill the nutritional requirements of the crop to be grown on a particular field. Since not all insecticides are compatible with every fertilizer formulation, and since choice and rates of application of insecticides and fertilizers vary with the specific insect, soil and crop in question, production and sale of general purpose insecticide-fertilizer combinations is not recommended. Custom mixed insecticides and fertilizers, designed to meet specific problems, are the only products currently approved. Insecticides with Federal registration for use in insecticide-fertilizer mixtures are acceptable, within the limits of such registration, by the Department of Agricultural Entomology of the North Dakota Agricultural Experiment Station."

Ohio: 4—Comments: We have no law

regulating the use and sale of pesticides. Mixtures with fertilizer are licensed as fertilizers with no provisions as to labeling other than as fertilizers. At the present, most mixtures are made up on a custom mix basis and very few offered for sale for commercial crops. 7—DDT, Do not know others as most pesticide mixtures are made up on custom mix basis. 8—Not for general use as yet. **Oklahoma:** 7, 8—No fertilizer-pesticide mixtures for use on commercial crops offered for sale in Oklahoma. If such mixtures are recommended by the Oklahoma Experiment Station in the future, they will be registered upon payment of regular fees, provided they are properly labeled and in compliance with Oklahoma laws and regulations. This material is of little importance in Oklahoma and has not presented a problem.

Oregon: 7—Principally Aldrin, some Heptachlor and Toxaphene. 14 (b) Do not require. 17—Pesticide "warning" label required on "Farmer's Mix."

Pennsylvania: 7—Chlordane, Lindane, and DDT. 18—Have analyzed a few.

Rhode Island: 1—Apparently such mixtures have not yet been sold in this state or have not been detected. Therefore, many of the answers refer to what we would require. 8—Tentatively undecided. 11—If properly labeled. 16—Yes, if ingredients are registered. 17—Only if ingredients are registered. 18—Reserve right. 20—Action will depend on Experiment Station Recommendations. **South Carolina:** 7—Chlordane, Aldrin, Heptachlor and Toxaphene. 9—In the past, a few pesticide-fertilizer mixtures have been registered before they were actually recommended, but at the present all of the material registered have either full or partial recommendation. 15—Our recent regulations do not specify that the tag be red, but we do require a colored tag. We felt that it would aid industry if we permitted different colored tags. 20—We have no requests for this type of mixture.

South Dakota: 7—Aldrin, Dieldrin. 13—Will do so soon.

Tennessee: 1—Can be sold; none accepted for use on food crops. 7—Chlordane, Aldrin, Dieldrin, Heptachlor, Toxaphene are allowed in Fertilizer-Pesticide Mixtures for uses other than food crops.

Texas: 1—We still refuse to register Fertilizer-Pesticide mixtures in Texas.

Utah: 1—No fertilizer-pesticide mixtures being sold for use on food crops. Answers indicate probable ac-

tion if they were accepted. Note: Four mixtures have been registered for use on lawns only.

Vermont: 7—Chlordane and DDT.

Virginia: 7—Virginia has a restricted List of Approved Grades of Fertilizers. Grades 0-14-14, 0-10-20 and 2-12-12, containing 8 lbs. of Aldrin or 8 lbs. of Heptachlor per ton, are recommended by the Virginia Experiment Station for use on peanuts for the control of Southern Corn Root Worm. 8—No other Fertilizer-Pesticide mixtures for use on food crops are recommended by the Virginia Experiment Station or permitted to be sold or distributed.

Washington: 7—Aldrin, 2,4-D. I.P.C. 16—Probably has been done without our knowledge. 21—By regulations.

West Virginia: 7—Chlordane. 18—Are analyzed for fertilizer component only.

Wisconsin: 7—Aldrin, Dieldrin, Chlordane. 14 (d)—Have not drawn up labels. 17, 18—Yes, on fertilizer, no under pesticide if custom mix. 20—None sold.

Wyoming: 1—Little interest in these mixtures, none registered. 2, 4, 5, 6—Before sale, mixtures must be registered and, meet all requirements (fee, labeling, etc.) of both laws.

Hawaii: 7—Weed killers, 2,4-D and 2,4,5-T.

Puerto Rico: 4—Under the Puerto Rico Economic Poison Act these products should be registered. We are now in the process of requiring registration of them. 7—To the present time, only aldrin is being used. 8—Fertilizer-Aldrin mixtures used in Puerto Rico is intended primarily to control the white grub attacking sugar cane roots. The Agricultural Experiment Station does not encourage this practice simply because it has proven of very little value in the control of this pest. 14—It will be required that the label show both ingredient statement for fertilizer and pesticide, directions for use and warning statement. Since we have just started to require registration, no label is available at present. 15—We have not reached a decision as to this matter. 1, 17, 20—These cases have not arisen yet.

Canada: 6—Collect fees—no tonnage tax. 7—Thiram, 2, 4-D, Lindane, Aldrin, Dieldrin, Heptachlor. 8—Some for lawns, none for food crops. 12, 13—Paper bags are generally used, but woven bags are permitted. 14—Must be registered and labeled under both laws. 19—Tolerance is that associated with accuracy of method. Excesses have not been demonstrated. 21—Not in specific relation to these mixtures.

Fertilizer Terms and Definitions

Adopted or Proposed by

Association of American Fertilizer Control Officials

FERTILIZER TERMS (T)

Definitions

- T-1. An **acid-forming fertilizer** is one that is capable of increasing the residual acidity of soil. (Official 1953).
- T-2. A **non-acid forming fertilizer** is one that is not capable of increasing the residual acidity of the soil. (Official 1953).
- T-3. The word **analysis**, as applied to fertilizers, shall designate the percentage composition of the product expressed in those terms that the law requires and permits. (Official 1953).
- T-4. A **brand** is a term, design, or trademark used in connection with one of several grades of fertilizer. (Official 1953).
- T-5. A **brand name** is a specific designation applied to an individual fertilizer. (Official 1953).
- T-6. A **fertilizer formula** shall express the quantity and grade of the crude stock materials used in making a fertilizer mixture. For example: 800 pounds of 16% superphosphate, 800 pounds of tankage (7.40 nitrogen and 9.15 total phosphoric acid), and 400 pounds of sulfate of Potash-magnesia twenty-six percent (26%) potash. (Official 1953).
- T-7. **Fertilizer grade** shall represent the minimum guaranty of its plant food expressed in terms of nitrogen (not ammonia), available phosphoric acid, and water-soluble potash. (Official 1953).
- T-8 **Primary fertilizer components** are those at present generally recognized by law as necessary to be guaranteed in fertilizers, namely: nitrogen, phosphoric acid (P_2O_5), and potash (K_2O). (Official 1953).
- T-9. **Secondary fertilizer components** are those other than the "primary fertilizer components" that are essential to the proper growth of plants and that may be needed by some soils. Some of these components are calcium, magnesium, sulfur, manganese, copper, zinc, and boron. (Official 1953).
- T-10. A **unit** of plant food is twenty (20) pounds, or one percent (1%)

of a ton. (Official 1953).

T-11 The term **Bulk Fertilizer** shall mean commercial fertilizer delivered to the purchaser, either in the solid or liquid state, in a non-packaged form to which a label cannot be attached. (Tentative 1952).

T-12 The term **Organic**, when applied to the source of a fertilizer component shall include only organic materials that are insoluble in water. (Tentative 1954).

Regulations

- T-R-1. The **grade** of a fertilizer should be included with its brand name, and so used by the manufacturer on sacks and in printing literature and by the control official in his reports and publications. No numeral shall be used in the brand name or grade of a commercial fertilizer except those referring to nitrogen, available phosphoric acid and potash. (Tentative 1953).
- T-R-2. The **order of terms** in mixed fertilizers shall be nitrogen first, phosphoric acid second, and potash third. (Official 1953).
- T-R-3. All **fertilizer components**, with the exception of potash (K_2O) and phosphoric acid (P_2O_5) if guaranteed, shall be stated in terms of the elements. (Official 1953).
- T-R-4. The **statement of guarantees** of mixed fertilizer shall be given in whole numbers. (Official 1953).
- T-R-5. When the **name of a fertilizer material** is used as a part of the brand name of a mixed fertilizer, as for example, blood, bone, or fish, the nitrogen or phosphoric acid shall be derived from or supplied entirely by the material named. When the name of a fertilizer material is used as a brand or as part of a brand and the nitrogen or phosphoric acid is not supplied by the material named the word "brand" shall follow the name of the materials. Example: "Fish Brand Fertilizer." (Official 1953).
- T-R-6. As the terms **phosphoric acid** and **potash** are used universally in guaranteeing and in reporting the analyses of fertilizers, it is recommended that the same terms also

be used in reporting and discussing the results of analyses of related materials. (Official 1953).

T-R-7. The **weights** appearing on packages of fertilizer, agricultural lime, and liming materials shall always mean **net weights**. (Official 1953).

Nitrogen products (Inorganic) (N-i)

Definitions

- N-i-1. **Ammoniated Superphosphate** (see P-3 phosphate products)
- N-i-2. **Ammonium nitrate** is chiefly the ammonium salt of nitric acid. It shall contain not less than thirty-three (33%) percent of nitrogen, one-half of which is in the ammonium form and one-half in the nitrate form. (Official 1951).
- N-i-3. **Calcium nitrate** is chiefly the calcium salt of nitric acid. It shall contain not less than fifteen (15%) percent nitrate nitrogen. (Official 1951).
- N-i-4. **Nitrate of potash (Potassium nitrate)** is chiefly the potassium salt of nitric acid. It shall contain not less than twelve (12%) percent of nitrogen and forty-four (44%) percent of potash. (Official 1951).
- N-i-5. **Nitrate of Soda (Sodium Nitrate)** is chiefly the sodium salt of nitric acid. It shall contain not less than sixteen (16%) percent nitrate nitrogen and twenty-six (26%) percent sodium. (Official 1952).
- N-i-6. **Nitrate of soda and potash (sodium and potassium nitrate)** is chiefly the sodium and potassium salts of nitric acid. It shall contain not less than fifteen (15%) percent of nitrate nitrogen, ten (10%) of potash and eighteen (18%) percent of sodium (Official 1952).
- N-i-7. **Sulfate of ammonia (ammonium sulfate)** is chiefly the ammonium salt of sulfuric acid. It shall contain not less than twenty and five-tenths (20.5%) percent of nitrogen. (Official 1951).
- N-i-8. **Ammonium sulfate nitrate** is

a double salt of ammonium sulfate and ammonium nitrate which are present in equal molecular proportions. It shall contain not less than twenty-six (26%) percent nitrogen, one-fourth of which is in the nitrate form and three-fourths in the ammonia form. (Official 1954).

Regulations

N-i-R-1. It is recommended that bags of **fertilizer nitrates** shall carry the warning "injurious to livestock." (Official 1950).

N-i-R-2. This Association recommends the disapproval of the registration of mixtures of ammonium nitrate and limestone or dolomite under the names "ammonium calcium nitrate," "calcium ammonium nitrate" and similar names which imply the presence of either calcium nitrate or ammonium carbonate in such mixtures. (Official 1953).

Nitrogen Products (Organic) (N-o)

Definitions

N-o-1. **Acidulated fish tankage, acidulated fish scraps**, is the rendered product derived from fish and treated with sulfuric acid. (Official 1950).

N-o-2. **Activated sewage products** are those made from sewage freed from grit and coarse solids and aerated after being inoculated with microorganisms. The resulting flocculated organic matter is withdrawn from the tanks, filtered with or without the aid of coagulants, dried, ground and screened. (Official 1950).

N-o-3. **Bat Guano** is partially decomposed bat manure. (Official 1951).

N-o-4. **Cyanamid** is a commercial product consisting principally of Calcium Cyanamid (CaNCN) and carbon and it shall contain not less than twenty (20%) percent of nitrogen. (Official 1953).

N-o-5. **Dried blood** is the collected blood of slaughtered animals, dried and ground and containing not less than twelve (12%) percent of nitrogen in organic forms. (Official 1950).

N-o-6. **Dried, pulverized, or shredded manures** are what the names indicate, and not mixtures or manures and other materials. (Tentative 1948).

N-o-7. **Garbage tankage** is the rendered, dried, and ground product derived from waste household food materials. (Official 1951).

N-o-8. **Hoof and horn meal** is processed dried, ground hoofs and

horns. (Official 1951).

N-o-9. **Peat** is partly decayed vegetable matter of natural occurrence. It is composed chiefly of organic matter that contains some nitrogen of low activity. (Official 1951).

N-o-10. **Fish tankage, fish scrap, dry ground fish, fish meal fertilizer grade**, is the dried ground product derived from rendered or unrendered fish. (Official 1950).

N-o-11. **Process tankage** are products made under steam pressure from crude inert nitrogenous materials, with or without the use of acids, for the purpose of increasing the activity of the nitrogen. These products shall be called "Process Tankage" with or without further qualification. The water-insoluble nitrogen in these products shall test at least fifty (50%) percent active by the alkaline, or eighty (80%) by the neutral permanganate method. (Official 1950).

N-o-12. **Tankage** (without qualifications) is the rendered, dried, and ground by-product, largely meat and bone from animals (slaughtered or that have died otherwise). (Official 1950).

N-o-13. **Sheep manure-wool waste** is the by-product from wool carding establishments consisting chiefly of sheep manure, seeds, and wool fiber. (Official 1951).

N-o-14. **Crude, inert, or slow-acting nitrogenous materials** are unprocessed organic substances relatively high in nitrogen but having a very low value as plant food and showing a low activity by both the alkaline and neutral permanganate methods, (below 50% and 80%, respectively). (Tentative 1948).

N-o-15. **Urea** is the commercial synthetic acid amide of carbonic acid and it shall contain not less than forty-two (42%) percent nitrogen. (Official 1952).

N-o-16. **Urea-formaldehyde fertilizer materials** are reaction products of urea and formaldehyde containing at least 35% nitrogen largely in insoluble but slowly available form. The water insoluble nitrogen in these products shall test not less than 40% active by the nitrogen activity index for Urea-formaldehyde compounds as determined by the appropriate A.O.A.C. method. (Tentative 1954).

Regulations

N-o-R-1. **Activity of water-insoluble nitrogen in mixed fertilizers**. The alkaline and neutral permanganate alkaline and neutral permanganate methods distinguish between the better and the poorer sources

of water-insoluble nitrogen, and do not show the percentage available of the materials. The available nitrogen of any product can be measured only after carefully conducted vegetation experiments.

(a) The methods shall be used on mixed fertilizers containing water-insoluble nitrogen amounting to three-tenths (0.3%) of one percent or more of the weight of the material. If a total nitrogen exceeds the minimum guaranty and is accompanied by a low activity of the insoluble nitrogen, the over-run shall be taken into consideration in determining the classification of the water-insoluble nitrogen.

(b) The water-insoluble nitrogen in mixed fertilizers showing an activity below fifty (50%) percent by the alkaline method shall be classed as inferior. This necessitates the use of both methods, also the provision as to over-run in (2), before classifying as inferior. (Tentative 1948).

N-o-R-2. The **nitrogen in cyanamid and urea** is synthetic, non-protein organic nitrogen. (Official 1950).

Phosphorus Products (P)

Definitions

P-1. The term **phosphoric acid** designates phosphorus pentoxide (P_2O_5). (Official 1952).

P-2. **Available phosphoric acid** is the sum of the water-soluble and the citrate-soluble phosphoric acid. (Official 1952).

P-3. **Ammoniated superphosphate** is a product obtained when superphosphate is treated with ammonia or with solutions which contain ammonia and other compounds of nitrogen. The guaranteed percentages of nitrogen and of available phosphoric acid shall be stated as part of the name. (Tentative 1952).

P-4. **Ammonium Phosphate** (fertilizer grade) is a product obtained when phosphoric acid is treated with ammonia, and consists principally of mono-ammonium phosphate, di-ammonium phosphate or a mixture of these two salts. The guaranteed percentage of nitrogen and the available phosphoric acid shall be stated as part of the name. (Official 1952).

P-5. **Ammonium phosphate-sulfate** (fertilizer grade) is a product obtained when a mixture of phosphoric acid and sulfuric acid is treated with ammonia. It consists principally of mixture of ammonium phosphates and ammonium sulfate. The guaranteed percentages of nitrogen and of available acid shall be stated as a part of the name. (Official 1952)

P-6. "Basic" lime phosphate (lime-based superphosphate) is a superphosphate to which liming materials have been added in a quantity at least six (6%) percent calcium carbonate equivalent in excess of the quantity required to convert all water-soluble phosphate to the citrate-soluble form. (Official 1951).

P-7. Basic Phosphate Slag is a by-product obtained in the manufacture of steel from phosphatic iron ores. The product shall contain no admixture of materials other than those resulting from the original

process of manufacture. It shall contain not less than twelve (12%) percent phosphoric acid, of which at least eighty (80%) percent shall be available phosphoric acid. It shall be ground so that not less than seventy (70%) percent of the material passes through a U. S. Standard No. 100 sieve and ninety percent (90%) passes through a U. S. Standard No. 50 sieve. Any basic phosphoric slag not conforming to this definition shall be designated low grade. (Official 1952).

P-8. Citrate-soluble ("reverted") phosphoric acid is that part of the total phosphoric acid in a fertilizer that is insoluble in water but soluble in a solution of citrate of ammonia according to the method adopted by the A.O.A.C. (Tentative 1948).

P-9. Di-Calcium phosphate is a manufactured product consisting chiefly of di-calcic salt of phosphoric acid. (Official 1951).

P-10. Acidulated bone is ground bone or bone meal that has been treated with sulfuric acid. (Official 1952).

P-11. Ground raw bone is ground animal bones that have not been previously steamed under pressure. (Official 1951).

P-12. Ground steamed bone is ground animal bones that have been previously steamed under pressure. (Official 1951).

P-13. Phosphate rock is a natural rock containing one or more calcium phosphate minerals of sufficient purity and quantity to permit its use, either directly or after concentration, in the manufacture of commercial products. (Official 1952).

P-14. Precipitated phosphate is a product consisting mainly of di-calcium phosphate obtained by neutralizing with calcium hydroxide the acid solution of either phosphate rock or processed bone. (Official 1951).

P-15. Superphosphate is a product obtained when rock phosphate is treated with either sulfuric acid, phosphoric acid, or a mixture of those acids. The guaranteed percentage of available phosphoric acid shall be stated as a part of the name. (Official 1951).

P-16. Soft Phosphate with colloidal clay is a very finely divided low-analysis by-product from mining Florida rock phosphate by a hydraulic process in which the colloidal materials settle at points in artificial ponds and basins farthest from the washer, and are later removed after the natural evaporation of the water. (Official 1951).

P-17. Calcium Metaphosphate is a vitreous product substantially free from crystalline phosphates, resulting from the treatment of phosphate rock with gaseous phosphate pentoxide at high temperatures. The guaranteed percentage of available phosphoric acid shall be stated as a part of the name. (Tentative 1951).

P-18. Fused Calcium-magnesium phosphate is a vitreous product substantially free from crystalline

The Nitrogen Content and Equivalent Acidity of Fertilizer Materials

Collected and compiled by the North Carolina Department of Agriculture

Materials	Percent Nitrogen	Equivalent Acidity Lbs. CaCO ₃		
		Per Unit Nitrogen	Per Pound Nitrogen	Per 100 Lbs. Product
INORGANIC NITROGEN				
Ammonium Sulfate	20.5	107	5.35	110.0
Ammo-Phos.	11.0	100	5.00	55.0
Anhydrous Ammonia	82.2	36	1.80	148.0
Ammonium Nitrate-Ammonia Solution	37.0	36	1.8	66.6
Ammonium Nitrate Solution	21.0	36	1.8	37.8
Calcium Nitrate	15.0	278	1.358*	20.38*
Calnitro	20.5	0	0	0
Crude Nitrogen Solution	44.0	24	1.20	52.8
Nitrate of Soda	16.0	368	1.808	28.88
Potassium Nitrate	13.0	408	2.008	26.08
Urea-Ammonia Liquor	45.5	36	1.80	81.9
Ammonium Nitrate	33	36	1.80	59.4
BASE GOODS				
Ammonium Sulfate Base	4-14-0	93	4.65	18.6
Anhydrous Ammonia Base	4-14-0	27	1.35	5.4
Urea-Ammonia Base	4-14-0	0	0	0
Urea-Ammonia Base	6-14-0	0	0	0
Urea-Ammonia Base	4-16-0	49	2.45	9.8
Urea-Ammonia Base	5-15-0	61	3.05	15.3
CHEMICAL ORGANIC NITROGEN				
Cyanamide	22.0	578	2.858	62.78
Urea	46.6	36	1.80	83.9
NATURAL ORGANIC NITROGEN				
Cocoa Shell Meal	2.7	128	0.608	1.68
Caster Pomace	4.8	18	0.90	4.3
Cottonseed Meal	6.7	28	1.40	9.4
Dried Blood	13.0	35	1.74	22.8
Fish Scrap	9.2	18	0.90	8.4
Fish Scrap	8.9	2	0.01	0.1
Guano, Peruvian	13.8	19	0.95	13.1
Guano, Whale	9.7	9	0.45	4.4
Milorganite	7.0	34	1.70	11.9
Tankage, Animal	9.1	3	0.15	1.4
Tankage, Garbage	2.5	548	2.708	6.78
Tankage, High Grade	8.4	15	0.75	7.4
Tankage, Low Grade	4.3	1448	7.208	31.08
Tankage, Packing House	6.0	338	1.658	9.98
Tankage, Process	7.4	31	1.55	11.5
Tobacco Stems	1.4	3568	17.808	25.08
Tobacco Stems	2.8	868	4.408	12.08
POTASH SALTS				
Manure Salts	-----	-----	-----	0
Muriate of Potash	-----	-----	-----	0
Potassium Nitrate	13.0	408	2.008	26.08
Sulfate of Potash	-----	-----	-----	0
Sulphate of Potash Magnesium	-----	-----	-----	0
PHOSPHATES				
Ammo-Phos.	11.0	100	5.00	55.0
Basic Slag	-----	-----	-----	67-718
Precipitated Bone	-----	-----	-----	29.08
Rock Phosphate	-----	-----	-----	10.08
Superphosphate	-----	-----	-----	0
Triple Superphosphate	-----	-----	-----	0

*B Indicates equivalent basicity instead of acidity.

phosphates, resulting from the fusion of phosphate rock with magnesium silicate. The guaranteed percentage of available phosphoric acid shall be stated as part of the name. (Tentative 1951).

P-19. Fused Tricalcium phosphate is a product resulting from the fusion of phosphate rock under conditions which result in the product which consists chiefly of the alpha form of tricalcium phosphate. The guaranteed percentage of available phosphoric acid shall be stated as a part of the name. (Tentative 1951).

P-20. Potassium metaphosphate (See K-8 potash products).

Regulations

P-R-1. Fused and noncrystalline phosphate products (definitions P-17, P-18, P-19, P-20) shall be marketed with an adequate statement concerning size of particles, in terms of percentages of the total product which pass through U. S. Standard sieves of stated sizes. (Tentative 1951).

Potassium Products (K)

Definitions

K-1. The term **potash** designates potassium oxide (K₂O). Tentative 1948).

K-2. Soluble potash is that portion of

the potash contained in fertilizers or fertilizer materials which is soluble in an aqueous ammonical solution of 0.8% ammonium oxalate, after boiling in a 1.14% solution of ammonium oxalate, (Tentative 1947).

K-3. Kainit is a potash salt containing potassium and sodium chlorides and sometimes sulfate of magnesia with not less than twelve (12%) percent of potash (K₂O). Tentative 1948).

K-4. Mine Run Potash Salts are potash salts containing a high percentage of chloride and from (20%) percent to thirty (30%) per-

Average Composition of the Common Fertilizer Materials

Collected and compiled by the North Carolina Department of Agriculture

FERTILIZER MATERIALS	Total Nitrogen (N)	Available Phos Acid (P ₂ O ₅)	Water Soluble Potash (K ₂ O)	Total Lime (CaO)	Total Magnesia (MgO)	Total Sulfate (SO ₄)	Total Chlorine (Cl)
Ammonium Nitrate-Ammonium Solution	37.0	—	—	—	—	—	—
Ammonium Nitrate Solution	21.0	—	—	—	—	—	—
Ammonium Phosphate (Mono)	11.0	48.0	—	2.0	0.5	6.5	—
Ammonium Sulphate	20.5	—	—	—	—	58.5	—
Ammoniated Superphosphate	4.0	16.0	—	23.0	0.5	15.0	0.3
Ammonium Nitrate	32-34	—	—	—	—	—	—
Blood Dried	13.0	—	—	0.5	—	—	0.6
Bone Ash	—	*38.0	—	46.5	1.0	0.5	—
Bone Black	1.0	*33.0	—	38.5	1.5	—	—
Bone Meal (Raw)	3.5	*22.0	—	31.5	1.0	0.5	0.2
Bone Meal (Steamed)	2.0	*28.0	—	33.0	0.5	0.5	—
Calcium Nitrate	15.5	—	—	27.0	2.5	—	0.2
Calnitro (20.5%)	20.5	—	—	9.0	—	1.5	—
Castor Pomace	6.0	1.5	0.5	0.5	0.5	—	0.3
Cocoa Meal	4.0	1.5	2.5	0.5	1.0	—	—
Cocoa Shell Meal	2.5	1.0	3.0	1.5	0.5	—	0.1
Cocoa Tankage	2.5	1.5	1.2	17.0	—	—	—
Cottonseed Meal (7%)	5.7	2.5	1.5	0.5	1.5	0.5	—
Cottonseed Meal (8%)	6.6	2.5	1.5	5.0	1.5	0.5	—
Cyanamid	22.0	—	—	54.0	—	0.5	—
Di-Ammonium Phosphate	20.5	50.0	—	—	—	—	—
Dolomite	—	—	—	30.5	20.0	0.5	—
Fish Scrap (Acidulated)	5.7	3.0	—	8.5	0.5	4.5	0.5
Fish Scrap (Dried)	9.5	6.0	—	8.5	0.5	0.5	1.5
Garbage Tankage	2.5	1.5	1.0	4.5	0.5	1.0	1.3
Hoof and Horn Meal	14.0	—	—	2.5	—	2.0	—
Kainit (20%)	—	—	20.0	1.0	6.0	9.0	43.3
Kieserite	—	—	—	0.5	33.0	66.0	—
Linseed Oil	5.6	1.5	1.3	0.5	0.5	1.0	0.1
Manure Salts	—	—	30.0	0.5	1.5	1.0	54.4
Milorganite	6.0	2.2	—	2.5	1.5	1.0	0.5
Muriate of Potash (50%)	—	—	50.0	0.5	0.5	1.5	45.2
Muriate of Potash (60%)	—	—	60.0	—	—	0.5	46.9
Nitrate of Potash	13.4	—	44.2	0.5	0.5	0.5	1.2
Nitrate of Soda	16.0	—	—	—	—	—	0.6
Nitrogen Solution 11	37.5	—	—	—	—	—	—
Peanut Meal	7.2	1.5	1.2	0.5	0.5	1.5	0.1
Peanut Hull Meal	1.2	0.5	0.8	—	—	—	—
Peat (Humus)	2.7	—	—	1.0	0.5	2.5	0.1
Peruvian Guano	13.0	12.5	2.5	11.0	1.0	3.5	1.9
Phosphate Rock	—	*33.0	0.1	48.8	0.2	0.1	—
Precipitated Phosphate	—	32.0	—	34.5	0.5	—	—
Process Tankage	8.2	—	—	0.5	—	1.0	—
Rapeseed Meal	6.0	2.0	0.1	1.0	0.5	0.5	—
Sardine Meal (Japanese)	10.9	5.0	0.4	8.0	0.5	0.5	1.0
Sheep Manure	1.2	1.0	2.0	5.0	2.0	1.5	1.0
Soybean Meal	7.0	1.2	1.5	0.5	0.5	0.5	0.0
Sulphate of Potash-Magnesia	—	—	26.0	2.0	11.0	45.5	2.2
Superphosphate (16%)	—	16.0	—	25.0	0.5	27.0	0.3
Superphosphate (20%)	—	20.0	—	28.0	0.5	29.0	0.3
Superphosphate (44%)	—	44.0	—	20.0	0.5	3.5	—
Tankage (Animal)	7.0	*10.0	—	15.5	0.5	1.0	0.7
Tobacco Stems	1.5	0.5	5.0	5.0	0.5	1.0	1.2
Urea-Ammonia Liquor B	45.5	—	—	—	—	—	—
Uramon	42.0	—	—	—	—	—	—
Whale Guano	8.5	6.0	—	9.0	0.5	—	—

*Total Phosphoric Acid

cent of potash (K₂O). (Official 1951).

K-5. Murite of Potash (Commercial Potassium Chloride) is a potash salt containing forty-eight (48%) percent to sixty-two (62%) percent of potash (K₂O) chiefly as chloride. (Official 1951).

K-6. Nitrate of Potash. (See N-i-4 under Nitrogen Products).

K-7. Nitrate of Soda-Potash (see N-i-6 under Nitrogen Products).

K-8. Potassium metaphosphate is a product composed chiefly of the crystalline compound represented by the formula KPO₃. Its fineness and content of phosphoric acid (P₂O₅) and of potash (K₂O) shall be stipulated. Example: Potassium metaphosphate - fifty - five (55%) percent available phosphoric acid (P₂O₅); thirty-seven (37%) percent potash (K₂O). (Official 1950).

K-9. Sulfate of Potash-magnesia is a potash salt containing not less than twenty-five (25%) percent potash (K₂O), nor less than twenty-five (25%) percent of sulfate of magnesia, and not more than two and one-half (2.5%) percent of chlorine. (Official 1950).

K-10. Double sulfate of potash and magnesia (Langbeinite.) Double sulfate of potash and magnesia

(Langbeinite) is a commercial product containing not less than twenty-one percent (21%) of potash (K₂O), nor less than fifty-three (53%) percent of sulfate of magnesia and not more than two and one-half (2.5%) percent of chlorine. (Official 1950).

K-11. Sulfate of potash (commercial potassium sulfate) is a potash salt containing not less than forty-eight (48%) percent of potash (K₂O) chiefly as sulfate, and not more than two and one-half (2.5%) percent of chlorine. (Official 1950).

K-12. Ashes from leached wood are unleached ashes resulting from burning wood that has been exposed to or digested in water or other liquid solvent, as in the extraction of dyes, so that a part of the plant food has been dissolved and removed. (Tentative 1948).

K-13. Unleached wood ashes are ashes from burned unleached wood that have had no part of their plant food removed and that contain four (4%) percent or more of water-soluble potash (K₂O). (Tentative 1948).

Regulations

K-R-1. Amount of chlorine permissible in fertilizers in which the

potash is claimed as sulfate. The chlorine in mixed fertilizers in which the potash is claimed as sulfate shall not exceed one-half or one (0.5%) percent more than what is called for in the minimum potash content based on the definition of sulfate of potash as formulated by the Committee (Calculate as follows: 0.05 times the percentage of potash found plus 0.5). (Official 1951).

K-R-2. That Potash values of all fertilizers and fertilizer materials be stated in the terms of the element potassium (K). This shall remain in a tentative status until the annual meeting of 1955.

Calcium and Magnesium Products (C)

Definitions

C-1. Air-slacked lime is a product composed of varying proportions of the oxide, hydroxide, and carbonate of calcium, or of calcium and magnesium, and derived from exposure of quicklime. (Official 1950).

C-2. Dolomite is a material composed chiefly of carbonates of magnesium and calcium in substantially unimolal (1-1.19) proportions. (Official 1950).

C-3. Agricultural Liming Material is material whose calcium and magnesium content is capable of neutralizing soil acidity. (Official 1950).

C-4. High calcic products are materials of which 90% or more of the total calcium and magnesium oxide content consists of calcium oxide. (Official 1950).

C-5. High magnesian products are materials in which more than 10 percent of the total calcium and magnesium oxide consists of magnesium oxide. (Official 1950).

C-6. Ground limestone (coarse-ground limestone) is the product obtained by grinding either calcite or dolomitic limestone so that all the material will pass a 10 mesh sieve and at least fifty (50%) percent will pass a 100-mesh sieve. (Official 1950).

C-7. Pulverized limestone (fine-ground limestone) is the product obtained by grinding either calcitic or dolomitic limestone so that all materials will pass a 20-mesh sieve and at least seventy-five (75%) percent will pass a 100-mesh sieve. (Official 1950).

C-8. The word lime when applied to liming materials means either calcium oxide or calcium and magnesium oxides. (Official 1950).

BORATES

Kind of Borate	% content		% Borax Equivalent	Amount of Material Required for	
	B ₂ O ₃	B		1 lb. B	1 lb. Borax
Fertilizer Borate—high grade	44	13.6	121	7.35 lb.	13.3 oz.
Fertilizer Borate—regular grade	34	10.5	93	9.45 lb.	17.0 oz.
Colemanite—high grade	32.6	10.1	89.3	9.9 lb.	18.0 oz.
Tronabor	44	13.6	121	7.35 lb.	13.3 oz.
Polybor-2	66	20.5	181	4.88 lb.	8.9 oz.

Conversion factors:

3.72 times the B₂O₃ content equals Na₂B₄O₇·10 H₂O (Sodium Borate)

.3107 times the B₂O₃ content equals B (Boron)

Information on borates and conversion factors furnished by American Potash & Chemical Corp. and Pacific Coast Borax Co., Division of Borax Consolidated, Ltd.

OTHER MINOR & TRACE ELEMENTS

Material	% equivalent		Pounds required for 1 pound of	
Copper sulfate, CuSO ₄ ·5H ₂ O	Cu 25.2	CuO 31.54	Cu 3.97	CuO 3.18
Ferric iron sulfate, Fe ₂ (SO ₄) ₃	Fe 20.0	Fe ₂ O ₃ 26.60	Fe 5.0	Fe ₂ O ₃ 3.50
Magnesium sulfate, MgSO ₄ , 80%	Mg 16.16	MgO 26.79	Mg 6.01	MgO 3.74
Manganese sulfate, MnSO ₄ , 65%	Mn 23.65	MnO 30.54	Mn 4.23	MnO 3.28
Manganese sulfate, MnSO ₄ , 70%	Mn 25.46	MnO 32.88	Mn 3.96	MnO 3.05
Manganous oxide, MnO, 62%	Mn 48.0	MnO 62.0	Mn 2.09	MnO 1.62
Zinc sulfate, ZnSO ₄ ·H ₂ O	Zn 36.0	ZnO 44.81	Zn 2.78	ZnO 2.24

Information and percent equivalents on "Other Minor & Trace Elements" furnished by Tennessee Corp.

WILEY & CO., INC.

ANALYTICAL & CONSULTING CHEMISTS

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C-9. Hydrated or slacked lime is a dry product consisting chiefly of the hydroxide of calcium and oxide-hydroxide of magnesium. (Official 1950).

C-10. Waste lime, by-product lime is any industrial waste or by-product containing calcium or calcium and magnesium in forms that will neutralize acids. It may be designated by prefixing the name of the industry or process by which it is produced, i.e., gas-house lime, tanners' lime, acetylene lime-waste, lime-kiln ashes, calcium silicate, etc. (Official 1950).

C-11. Quick lime, burned lime, caustic lime, lump lime, unslacked lime, are calcinated materials, the major part of which is calcium oxide, in natural association with a lesser amount of magnesium oxide, and which is capable of slacking with water. (Official 1950).

C-12. Ground Shells is the product obtained by grinding the shells of

mollusks so that not less than fifty (50%) percent shall pass a 100-mesh sieve. The product shall also carry the name of the mollusk from which said product is made. (Official 1950).

C-13. Ground shell marl is the product obtained by grinding natural deposits of shell marl so that at least seventy-five (75%) percent shall pass a 100-mesh sieve. (Official 1950).

C-14. Gypsum, land plaster or crude calcium sulfate is a product consisting chiefly of calcium sulfate. It may contain twenty (20%) percent of combined water (it does not neutralize acid solids). (Official 1950).

C-15. Magensia (magnesium oxide) is a product consisting chiefly of the oxide of magnesium. Its grade shall be stipulated. Example: Magensia—75 percent MgO. (Official 1950).

Regulation

C-R-1. The term "lime" shall not be used in the registration, labeling, or guaranteeing of fertilizer or fertilizing materials unless the lime is in a form or forms to neutralize soil acidity. (Official 1950).

Manganese Products (M)

Definition

M-1. Manganese sulfate. The term manganese sulfate, when applied to an ingredient of a mixed fertilizer, shall designate anhydrous manganous sulfate ($MnSO_4$). (Official 1950).

Specialty Fertilizers (S)

S-1. Any product coming under the fertilizer law shall not carry labels to emphasize that dilutions will make so many gallons of fertilizer. Specific claims, such as "contents of this package will make—gallons of fertilizer" shall be prohibited. The labels shall not carry any extravagant and misleading advertising and claims. (Tentative 1952).

MIXED FERTILIZERS . . . Superphosphate, bulk and bagged . . . Fertilizer Materials . . . Sodium Silico Fluoride . . . Sulphuric acid.

AGRICULTURAL PESTICIDES in spray and dust forms . . . salts . . . minor elements essential in plant nutrition.

**Domestic and Export Inquiries Will
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**WILSON & TOOMER
FERTILIZER COMPANY**

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GENERAL OFFICES • JACKSONVILLE, FLORIDA

**FLORIDA
AGRICULTURAL
SUPPLY CO.**



Locate plant nutrient content of material in this column—

To use, simply run down the column at extreme left (1 to 99) to the number corresponding to the plant nutrient content of the material you are using. Then follow that line across to the column headed by the number (1 to 33) of units of that plant nutrient desired in the grade you are mixing. The figure appearing in the vertical column at the point where it meets the horizontal line is the number of pounds of material required for the desired analysis.

Note: This is a straight mathematical percentage table, and does not allow for any chemical changes due to reactions in mixing; neither does it compensate for material losses in processing; nor does it allow for nutrient gains due to fractional content of this nutrient in materials added for their content of other nutrients.

Percentage Table

for Calculation of Fertilizer Formulas

To use, simply run down the column at extreme left (1 to 99) to the number corresponding to the plant nutrient content of the material you are using. Then follow that line across to the column headed by the number (1 to 33) of units of that plant nutrient desired in the grade you are mixing. The figure appearing in the vertical column at the point where it meets the horizontal line is the number of pounds of material required for the desired analysis.

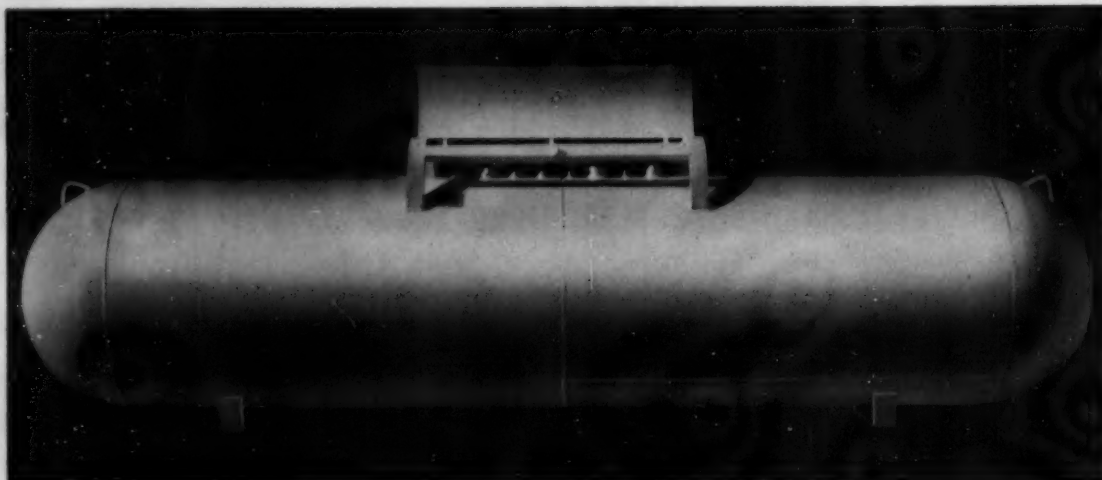
Note: This is a straight mathematical percentage table, and is not allow for any chemical changes due to reactions in mixing; neither does it allow for material losses in processing; nor does it allow for nutrient gains due to fractional content of this nutrient in materials added for their content of other nutrients.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	
1	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
2	286	572	858	1143	1429	1715	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
3	250	500	750	1000	1250	1500	1750	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
4	223	445	667	889	1111	1334	1556	1778	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
5	200	400	600	800	1000	1200	1400	1600	1800	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
6	334	667	1000	1334	1667	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
7	286	572	858	1143	1429	1715	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
8	250	500	750	1000	1250	1500	1750	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
9	223	445	667	889	1111	1334	1556	1778	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
10	200	400	600	800	1000	1200	1400	1600	1800	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
11	182	364	546	726	910	1092	1274	1456	1638	1819	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
12	167	334	500	667	834	1000	1167	1334	1500	1667	1834	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
13	154	308	462	616	770	924	1078	1232	1386	1540	1694	1847	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
14	143	286	429	572	715	858	1000	1143	1286	1429	1572	1715	1858	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
15	134	267	400	534	667	800	934	1067	1200	1334	1467	1600	1734	1867	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
16	125	250	375	500	625	750	875	1000	1125	1250	1375	1500	1625	1750	1875	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
17	118	236	353	471	589	706	824	942	1060	1177	1295	1412	1530	1648	1765	1882	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
18	112	223	334	445	556	667	778	889	1000	1112	1223	1334	1445	1556	1667	1778	1889	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
19	106	211	316	422	527	632	737	843	948	1053	1158	1264	1369	1474	1579	1685	1790	1895	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
20	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
21	96	191	286	381	477	572	667	762	858	953	1048	1143	1239	1334	1429	1524	1620	1715	1810	1905	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
22	91	187	273	368	455	542	637	728	819	909	1000	1091	1182	1273	1364	1455	1546	1637	1728	1819	1909	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
23	87	174	261	348	435	522	609	696	783	870	957	1044	1131	1218	1305	1392	1479	1566	1653	1740	1827	1914	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
24	84	167	250	334	417	500	584	667	750	834	917	1000	1084	1167	1250	1334	1417	1500	1584	1667	1750	1834	1917	2000	2000	2000	2000	2000	2000	2000	2000	2000	
25	80	160	240	320	400	480	560	640	720	800	880	960	1040	1120	1200	1280	1360	1440	1520	1600	1680	1760	1840	1920	2000	2000	2000	2000	2000	2000	2000	2000	
26	77	154	231	308	385	462	539	616	693	770	847	924	1000	1077	1154	1231	1308	1385	1462	1539	1616	1693	1770	1847	1924	2000	2000	2000	2000	2000	2000	2000	
27	75	149	223	297	371	445	519	593	667	741	815	889	963	1038	1112	1186	1260	1334	1408	1482	1556	1630	1704	1778	1852	1926	2000	2000	2000	2000	2000	2000	
28	72	143	215	286	358	429	500	572	643	715	786	858	929	1000	1072	1143	1215	1286	1358	1429	1500	1572	1643	1715	1786	1858	1929	2000	2000	2000	2000	2000	
29	69	138	207	276	345	414	483	552	621	690	759	828	897	966	1035	1104	1173	1242	1311	1380	1449	1518	1587	1656	1725	1794	1863	1932	2000	2000	2000		
30	67	134	200	267	334	400	467	534	600	667	734	800	867	934	1000	1067	1134	1200	1267	1334	1400	1467	1534	1600	1667	1734	1800	1867	1934	2000	2000	2000	
31	65	130	194	259	323	388	452	517	582	647	711	775	839	904	968	1033	1097	1162	1226	1291	1355	1420	1484	1549	1613	1678	1742	1807	1871	1936	2000	2000	
32	63	125	188	250	313	375	438	500	563	625	688	750	813	875	938	1000	1063	1125	1188	1250	1313	1375	1438	1500	1563	1625	1688	1750	1813	1875	1938	2000	
33	61	122	182	243	304	364	425	485	546	607	667	728	788	849	910	970	1031	1091	1151	1212	1272	1333	1393	1454	1515	1575	1636	1696	1757	1817	1879	1940	
34	59	118	177	236	295	353	412	471	530	589	648	706	765	824	883	942	1000	1059	1118	1177	1236	1295	1353	1412	1471	1530	1589	1648	1706	1765	1824	1883	
35	58	115	172	229	286	343	400	458	515	572	629	686	743	800	858	915	972	1029	1086	1143	1200	1258	1315	1372	1429	1486	1543	1600	1658	1715	1772	1829	
36	56	112	167	223	278	334	389	445	500	556	612	667	723	778	834	889	945	1000	1056	1112	1167	1223	1278	1334	1389	1445	1500	1556	1612	1667	1723	1778	
37	55	109	163	217	271	325	379	433	487	541	595	649	703	757	811	865	919	973	1028	1082	1136	1190	1244	1298	1352	1406	1460	1514	1568	1622	1676	1730	
38	55	106	158	211	264	317	369	422	474	527	579	632	685	737	790	843	895	947	1000	1053	1106	1158	1211	1264	1316	1369	1422	1474	1527	1580	1632	1685	1737
39	52	103	154	206	257	308	359	411	462	513	565	616	667	718	770	821	872	924	975	1026	1077	1129	1180	1231	1283	1334	1385	1436	1488	1539	1590	1642	1693
40	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650
41	49	98	147	196	244	293	342	391	440	488	537	586	635	683	732	781	830	879	927	976	1025	1074	1122	1171	1220	1269	1318	1366	1415	1464	1513	1561	1610
42	48	96	143	191	239	286	334	381	429	477	524	572	620	667	715																		

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
51	40	79	118	157	197	236	275	314	353	393	432	471	510	550	589	628	667	706	746	785	824	863	902	942	981	1020	1059	1099	1138	1177	1216	1255	1295
52	39	77	116	154	193	231	270	308	347	385	424	462	500	539	577	616	654	693	731	770	808	847	885	924	962	1000	1039	1077	1116	1154	1193	1231	1270
53	38	76	114	152	190	228	266	304	342	380	418	456	494	531	569	607	645	683	721	759	797	835	873	911	949	987	1024	1062	1100	1138	1176	1214	1252
54	38	75	112	149	186	223	260	297	334	371	408	445	482	519	556	593	630	667	704	741	778	815	852	889	926	963	1000	1038	1075	1112	1149	1186	1223
55	37	73	110	146	182	219	255	291	328	364	400	437	473	510	546	582	619	655	691	728	764	800	837	873	910	946	982	1019	1055	1091	1128	1164	1200
56	36	72	108	143	179	215	250	286	322	358	393	429	465	500	536	572	608	643	679	715	750	786	822	858	893	929	965	1000	1036	1072	1108	1143	1179
57	35	71	106	141	176	211	246	281	316	351	386	422	457	492	527	562	597	632	667	702	737	772	807	843	878	913	948	983	1018	1053	1088	1123	1158
58	35	69	104	138	173	207	242	276	311	345	380	414	449	483	518	552	587	621	655	690	725	759	794	828	863	897	932	966	1000	1035	1069	1104	1138
59	34	68	102	136	170	204	238	272	306	339	373	407	441	475	509	543	577	611	645	678	712	746	780	814	848	882	916	950	984	1017	1051	1085	1119
60	34	67	100	134	167	200	234	267	300	334	367	400	434	467	500	534	567	600	634	667	700	734	767	800	834	867	900	934	967	1000	1034	1067	1100
61	33	66	99	132	164	197	230	263	296	328	361	394	427	460	492	525	558	591	623	656	689	722	755	787	820	853	886	919	951	984	1017	1050	1082
62	33	65	97	130	162	194	226	259	291	323	355	388	420	452	484	517	549	581	613	646	678	710	742	775	807	839	871	904	936	968	1000	1033	1065
63	32	64	96	127	159	191	223	254	286	318	350	381	413	445	477	508	540	572	604	635	667	699	731	762	794	826	858	889	921	953	985	1016	1048
64	32	63	94	125	157	188	219	250	282	313	344	375	407	438	469	500	532	564	595	625	656	687	719	750	781	812	844	875	907	938	969	1000	1032
65	31	62	93	124	154	185	216	247	277	308	339	370	401	432	462	493	524	554	585	616	647	677	708	739	770	801	831	862	893	924	954	985	1016
66	31	61	91	122	152	182	213	243	273	304	334	364	394	425	455	485	516	546	576	606	637	667	697	728	758	788	818	849	879	909	940	970	1000
67	30	60	90	120	150	180	209	239	269	299	329	359	389	418	448	478	508	538	568	598	627	657	687	717	747	777	806	836	866	896	926	956	986
68	30	59	89	118	148	177	206	236	265	295	324	353	383	412	442	471	500	530	559	589	618	648	677	706	736	765	795	824	853	883	912	942	971
69	29	58	87	116	145	174	203	232	261	290	319	348	377	406	435	464	493	522	551	580	609	638	667	696	725	754	783	812	841	870	899	928	957
70	29	58	86	115	143	172	200	229	259	288	317	346	375	404	433	462	491	520	549	578	607	636	665	694	723	752	781	810	839	868	897	926	955
71	29	57	85	113	141	170	198	226	254	282	310	339	367	395	423	451	479	508	536	564	592	620	648	677	705	733	761	789	817	846	874	902	930
72	28	56	84	112	139	167	195	223	250	278	306	334	362	389	417	445	473	500	528	556	584	612	640	668	696	724	752	780	808	836	864	892	920
73	28	55	83	110	137	165	192	220	247	274	302	329	357	384	411	439	466	494	521	548	576	603	631	658	685	713	740	768	795	822	850	877	905
74	28	55	82	109	136	163	190	217	244	271	298	325	352	379	406	433	460	487	514	541	568	595	622	649	676	703	730	757	784	811	838	865	892
75	27	54	80	107	134	160	187	214	240	267	294	320	347	374	400	427	454	480	507	534	560	587	614	640	667	694	720	747	774	800	827	854	880
76	27	53	79	106	132	158	185	211	237	264	290	316	343	369	395	422	448	474	500	527	553	579	606	632	658	685	711	737	764	790	816	843	869
77	26	52	78	104	130	156	182	208	234	260	286	312	338	364	390	416	442	468	494	520	546	572	598	624	650	676	702	728	754	780	806	832	858
78	26	52	77	103	129	154	180	206	231	257	283	308	334	360	385	411	436	462	488	513	539	565	590	616	642	667	693	718	744	770	795	821	847
79	26	51	76	102	127	152	178	203	228	254	279	304	330	355	380	406	431	456	482	507	532	557	583	608	633	659	684	709	735	760	785	811	836
80	25	50	75	100	125	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600	625	650	675	700	725	750	775	800	825
81	25	50	75	99	124	149	173	198	223	247	272	297	321	346	371	396	420	445	470	494	519	544	568	593	618	642	667	692	717	741	766	791	815
82	25	49	74	98	122	147	171	196	220	244	269	293	318	342	366	391	415	440	464	488	513	537	561	586	610	635	659	683	708	732	757	781	805
83	25	49	73	97	121	145	169	193	217	241	265	290	314	338	362	386	410	434	458	482	507	531	555	579	603	627	651	675	699	723	747	771	796
84	24	48	72	96	120	143	167	191	215	239	262	286	310	334	358	381	405	429	453	477	500	524	548	571	595	619	643	667	691	715	739	762	786
85	24	48	71	95	118	142	165	189	212	236	259	283	306	330	353	377	400	424	448	471	495	518	542	565	589	612	636	659	683	706	730	753	777
86	24	47	70	94	117	140	163	187	210	233	256	280	303	326	349	373	396	419	442	466	489	512	535	559	582	605	628	652	675	698	721	745	768
87	23	46	69	92	115	138	161	184	207	230	253	276	299	322	345	368	391	414	437	460	483	506	529	552	575	598	621	644	667	690	713	736	759
88	23	46	69	91	114	137	160	182	205	228	250	273	296	319	341	364	387	410	432	455	478	500	523	546	569	591	614	637	660	682	705	728	750
89	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338	360	383	405	427	450	472	495	517	540	562	585	607	630	652	675	697	720	742
90	23	45	67	89	112	134	156	178	200	223	245	267	289	312	334	356	378	400	423	445	467	489	512	534	556	578	600	623	645	667	689	712	734
91	22	44	66	88	110	132	154	176	198	220	242	264	286	308	330	352	374	396	418	440	462	484	506	528	550	572	594	616	638	660	682	704	726
92	22	44	66	87	109	131	153	174	196	218	240	261	283	305	327	348	370	392	414	435	457	479	500	522	544	566	587	609	631	653	674	696	718
93	22	44	65	87	108	130	151	173	194	216	237	259	280	302	323	345	366	388	409	431	452	474	495	517	538	560	581	603	624	646	667	689	710
94	22	43	64	86	107	128	149	171	192	213	235	256	277	298	320	341	362	383	405	426	447	469	490	511	532	554	575	596	618	639	660	681	703
95	22	43	64	85	106																												

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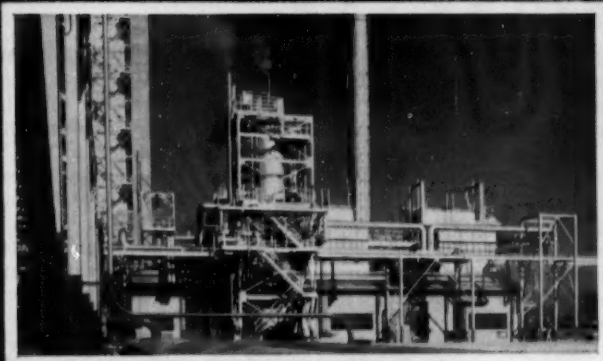
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Liquid Fertilizer

for Direct Application

by K. D. JACOB AND WALTER SCHOLL
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U. S. Department of Agriculture
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The use of liquid fertilizers has increased steadily in the United States during the past quarter century. From a very minor position, chiefly as specialty products sold in small packages for home consumption, their manufacture and marketing, both as intermediates for further processing and as products for direct application to farm crops, now rank as major operations in some parts of the fertilizer industry. Further expansion in the production and use of such fertilizers is anticipated.

Large-scale manufacture of synthetic ammonia, initiated in this country in the 1920's, set the stage for the development of liquid fertilizers. Major effort was directed first to the use of liquid nitrogen materials (anhydrous ammonia, aqua ammonia, and aqueous solutions of ammonia with ammonium nitrate or urea) in the preparation of solid mixed fertilizers (9, 10, 22, 34). Since such use of these materials resulted in lower production costs and better physical condition of the mixtures, the practice soon spread throughout the mixed fertilizer industry. Liquid materials now supply approximately half of the total nitrogen content (778,099 short tons in 1953-54) of mixed fertilizers in the United States and Territories.

Attention was next given to the direct application of liquid nitrogen materials as fertilizers. Use of anhydrous ammonia in this way—initiated on a continuing commercial basis in California in the early 1930's by the Shell Chemical Corporation (23, 36)—was confined, at first, mostly to its application in irrigation water. Shortly after World War II, however, interest in the injection of anhydrous ammonia directly into the soil was greatly stimulated by the research investigations at the Mississippi Agricultural Experiment Station under the leadership of W. B. Andrews (3, 4, 5). This practice spread rapidly in the Mississippi Delta States and then to other parts of the country, especially the North

Central region.²

Use of aqueous solutions of nitrogen compounds as direct application materials made little headway until well after World War II.

Application of phosphoric acid directly as a fertilizer is said to have commenced about 1934 (17). Its use in this way has been confined almost entirely to the West, mostly as an additive to irrigation water (18).

Domestic manufacture of liquid mixed fertilizers for application to farm crops appears to have had its beginning in California in the early 1920's (27). Thus far, the use of such fertilizers has been chiefly in irrigation water in the West. Very recently, however, there has been much interest in applying liquid mixtures directly to the soil, especially in the Middle West.

Consumption of Primary Nutrients

Evaluation of the present position and future prospects of liquid fertilizers for direct application will be aided by a brief review of the remarkable recent growth of consumption of the primary plant nutrients—nitrogen (N), phosphoric oxide (P_2O_5), and potash (K_2O). Thus the total consumption of these nutrients rose steadily from about 3.4 million tons in 1946-47 to 5.9 million tons in 1953-54, an increase of nearly 75 percent (Figure 1). During this period the annual consumption of nitrogen increased 136 percent to 1.85 million tons, and the use of potash mounted 110 percent to 1.81 million tons. Phosphoric oxide was the only nutrient that failed to show continued increase throughout this time. Its use rose to a maximum of 2.27 million tons in 1952-53, an increase of 31 percent over 1946-47, and then dropped slightly (to 2.24 million tons) in the following year. (Figure 1)

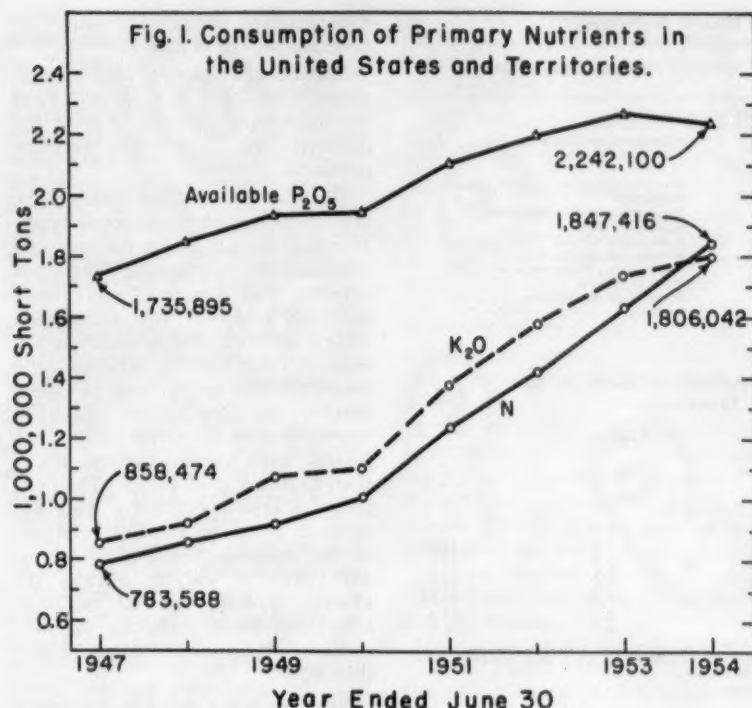
Since World War I the annual consumption of nitrogen has been close to but generally somewhat

lower than that of potash. In 1953-54 the tonnage of nitrogen exceeded that of potash for the first time in nearly 20 years. It appears that nitrogen may continue to hold a superior position to potash, at least for the near future. The consumption of phosphoric oxide has been much higher than that of either nitrogen or potash, almost from the beginning of the domestic commercial fertilizer industry about 100 years ago. Recently, however, the gap between phosphoric oxide and the other two nutrients has narrowed steadily. Thus, the ratio for $N:P_2O_5:K_2O$ changed from 0.52:1.00:0.57 in 1949-50 to 0.65:1.00:0.72 in 1951-52 and then to 0.82:1.00:0.81 in 1953-54. Continuation of this rate of change in the proportionate use of the nutrients would bring the respective consumptions of nitrogen and potash to the phosphoric oxide level before 1960.

The total consumption of primary nutrients in the form of individual materials, as well as that in mixed fertilizers, has also risen continuously and very markedly in recent years. Thus the consumption of nutrients in direct application materials was 1,720,000 tons in 1953-54, or double that in 1946-47. As shown in Figure 2, the quantity of nitrogen used in this way mounted steadily from 315,685 tons to 1,069,317 tons, an increase of 239 percent. Likewise, the consumption of potash in materials for direct application rose from 39,194 tons to 210,010 tons, or 436 percent. In contrast, the con-

2. The regional divisions of the country are: NEW ENGLAND—Maine, N. H., Vt., Mass., R. I., Conn.; MIDDLE ATLANTIC—N. Y., N. J., Pa., Del., D. C., Md., W. Va.; SOUTH ATLANTIC—Va., N. C., S. C., Ga., Fla.; EAST NORTH CENTRAL—Ohio, Ind., Ill., Mich., Wis.; WEST NORTH CENTRAL—Minn., Iowa, Mo., N. Dak., S. Dak., Nebr., Kans.; EAST SOUTH CENTRAL—Ky., Tenn., Ala., Miss.; WEST SOUTH CENTRAL—Ark., La., Okla., Tex.; MOUNTAIN—Mont., Idaho, Wyo., Colo., N. Mex., Ariz., Utah, Nev.; PACIFIC—Wash., Oreg., Calif.; TERRITORIES—T. H., P. R., Alaska.

Presented at the Sixth Annual Pacific Northwest Fertilizer Conference, Boise, Idaho, June 28-30, 1955 and is a part of the published Proceedings of the Sixth Annual Pacific Northwest Fertilizer Conference.



sumption of phosphoric oxide in direct application materials has shown a downward trend since 1949-50. The quantity used in 1953-54 (440,677 tons) was only 73 percent of the quantity (605,473 tons) in 1949-50 and 87 percent of that (505,407 tons) in 1946-47. (Figure 2)

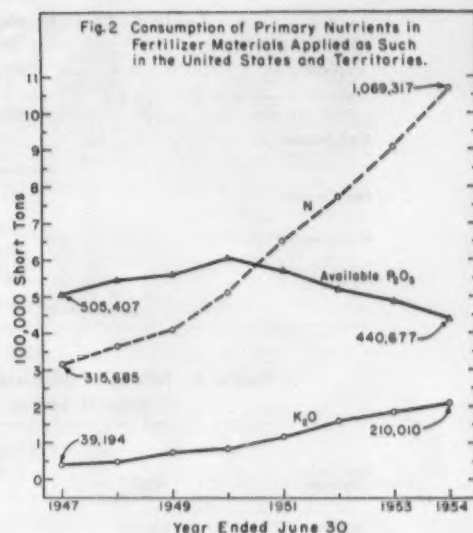
Historically, a large portion of the fertilizer nitrogen has been applied directly as the individual materials. The portion thus used has risen steadily since World War II—from 40.3 percent in 1946-47 to 57.9 percent in 1953-54 (Table 1). As a result of the growing recognition of the agronomic advantages in properly timed supplemental applications of straight nitrogen materials to many crops, it may be expected that a still larger part of the nitrogen will be used in this way. The proportionate use of potash for direct application, though very much smaller than that of nitrogen, has also shown continuous increase in recent years—4.6 percent in 1946-47 to 11.6 percent in 1953-54. It should

be noted, however, that the proportion is still considerably below the level (around 20 percent) for the period 1930 to 1940. Prior to the war, and until 1950-51, some 30 to 40 percent of the phosphoric oxide was used as direct application materials. Subsequently, however, the proportion has progressively decreased. It was 19.7 percent in 1953-54. (Table 1)

Consumption of Liquid Fertilizers

The total consumption of liquid fertilizers (anhydrous ammonia, nitrogen solutions, phosphoric acid, and mixed fertilizers) for direct application rose from 47,136 tons in 1946-47 to 584,860 tons in 1953-54, an increase of 1,141 percent (Table 2). Likewise, the quantities of anhydrous ammonia and nitrogen solutions used in this way increased 323,160 tons (1,183 percent) and 184,264 tons (2,515 percent), respectively. The increases in phosphoric acid (9,359 tons, 159 percent) and mixed fertilizers (20,941 tons, 317 percent) were much smaller. (Table 2)

Anhydrous ammonia accounted for



58 percent of the total tonnage of liquid fertilizers in 1946-47, as compared with 60 percent in 1953-54. The corresponding percentages for the other liquid products are: nitrogen solutions, 16 and 33; phosphoric acid, 12 and 2.5; and mixed fertilizers 14 and 4.5. Although there was no change in the order of the several products with respect to their proportionate quantities, the nitrogen solutions supplied a much larger share of the tonnage of liquids in 1953-54 than in 1946-47. The proportion furnished by anhydrous ammonia increased slightly, whereas that for phosphoric acid and mixed fertilizers decreased considerably.

Liquid fertilizers comprised only 0.3 percent of the total quantity of primary nutrient fertilizers used in 1946-47. The proportion increased to 2.6 percent in 1953-54.

Classification of Liquid Fertilizers

Liquid fertilizers may be classified in several ways. A convenient classification based on their pressure characteristics affords, also, a partial grouping of the products with respect to their nutrient and fertilizer constituents. As shown in Table 3, a classification of this kind places the products in two main categories—liquefied gases and aqueous solutions—which are further divided into

Table 1. Distribution of Consumption of Primary Nutrients Between Mixed Fertilizers and Fertilizer Materials Applied as Such

Year Ended June 30	Proportion in Materials			
	Nitrogen	Available P_2O_5	K_2O	N + P_2O_5 + K_2O
	Percent	Percent	Percent	Percent
1947	40.3	29.1	4.6	25.5
1948	42.4	29.7	5.2	26.4
1949	44.3	28.7	6.9	26.4
1950	50.7	31.1	7.7	29.6
1951	52.8	26.9	9.1	28.5
1952	54.4	23.6	10.2	27.9
1953	55.5	21.5	10.7	28.0
1954	57.9	19.7	11.6	29.2

Table 2. Consumption of Liquid Fertilizers in the United States and Territories

(Short Tons of Material as Applied)

Product	Year Ended June 30	
	1947	1954
Anhydrous ammonia	27,314	350,474
Nitrogen solutions ¹	7,324	191,592
Phosphoric acid	5,887	15,246
Mixed fertilizers ²	6,667 ³	27,548
Total	47,136	584,860

¹ Aqua ammonia and all other aqueous solutions supplying nitrogen as the only primary nutrient.

² Continental United States only. Includes ammonium phosphate solutions.

³ California only.

Table 3. Classification of Liquid Fertilizers

Type	Primary Nutrients Supplied	Fertilizer Components
Liquefied Gases		
High Pressure	N	Anhydrous ammonia
Aqueous Solutions		
Low Pressure	N	Ammonia
	N	Ammonia, ammonium nitrate
	N	Ammonia, urea
	N	Ammonium nitrate
	N	Ammonium nitrate, urea
Nonpressure	N	Ammonium nitrate, sodium nitrate
	P ₂ O ₅	Phosphoric acid
	N, P ₂ O ₅	Ammonium phosphates
	N, P ₂ O ₅ , K ₂ O	Various

Table 4. Nitrogen Materials Applied as Such in the United States and Territories

Year Ended June 30	Total Short Tons of N	Proportion as—		A + B Percent
		Anhydrous Ammonia (A) Percent	Solutions ¹ (B) Percent	
1947	315,685	7.1	0.9	8.0
1948	363,438	9.8	1.6	11.4
1949	407,672	13.3	1.0	14.2
1950	510,092	13.7	1.5	15.2
1951	653,018	14.9	1.6	16.5
1952	773,937	17.8	1.8	19.7 ²
1953	908,961	19.6	2.3	21.9
1954	1,049,317	26.9	4.7	31.6

¹ Aqua ammonia; aqueous solutions of ammonia with ammonium nitrate or urea; and aqueous solutions of ammonium nitrate alone or with urea or sodium nitrate.

² Differs from sum of individual figures because of rounding.

Table 5. Liquid Nitrogen Materials Applied as Such in the United States and Territories (Short Tons of N)

Year Ended June 30	Anhydrous Ammonia	Solutions: Nitrogen Content—		Total
		32% or Under ¹	Over 32% ²	
1947	22,397	78	3,815	25,290
1948	35,556	1,301	4,482	41,339
1949	53,789	1,497	2,750	58,036
1950	70,123	3,053	4,444	77,620
1951	97,107	4,438	5,871	107,416
1952	137,983	4,532	9,747	152,262
1953	178,074	10,042	11,258	199,374
1954	287,389	27,217	22,868	337,474

¹ Chiefly aqua ammonia, but includes aqueous solutions of ammonium nitrate alone or with urea or sodium nitrate.

² Aqueous solutions of ammonia with ammonium nitrate or urea.

Table 6. Regional Distribution of Facilities for Manufacturing Liquid Nitrogen Fertilizers in the United States, as of June 1, 1955¹

Region	Anhydrous Ammonia	Number of Facilities	
		Aqua Ammonia	Nitrogen Solutions ² Other
New England	0	0	0
Middle Atlantic	6	1	1
South Atlantic	1	1	1
East North Central	4	3	2
West North Central	4	2	3
East South Central	5	0	1
West South Central	10	6	4
Mountain	0	0	0
Pacific	7	4	1
Territories	0	0	0
United States	37	17	13

¹ Excludes facilities under construction.

² Excludes ammonium phosphate solutions. The data relate only to facilities located at plants manufacturing anhydrous ammonia.

Table 7. Number of Anhydrous Ammonia Distributors and Independent Applicators, as of January-June 1954

Region	Number ¹	Percent of Total	Region	Number ¹	Total Percent of
New England	0	0	West South Central	85	17.6
Middle Atlantic	6	1.3	Mountain	19	3.9
South Atlantic	13	2.7	Pacific	23	4.8
East North Central	77	16.0	Territories	2	0.4
West North Central	171	35.5	United States	482	100.0
East South Central	86	17.8			

¹ Gross number. Includes duplication of distributors and applicators operating in more than one

high pressure, low pressure, and non-pressure types. (Table 3)

Anhydrous ammonia, with a gauge pressure of 211 p. s. i. at 104° F., is the only representative of both the liquefied gas and high pressure products.

The aqueous solutions embrace the low pressure and nonpressure types, and they include single nutrient and multinutrient products. The low pressure type consists of solutions of ammonia alone or with ammonium nitrate or urea, and nitrogen is the only nutrient therein. Although the limits for this group have not been defined specifically, the materials currently used for direct application usually have vapor pressures lower than 25 p. s. i. g. at 104° F. The non-pressure type comprises a wide variety of products, such as solutions of (a) ammonium nitrate alone or with urea or sodium nitrate, (b) phosphoric acid, and (c) multinutrient fertilizers, including the ammonium phosphates and mixed fertilizers.

Nitrogen is the only plant nutrient supplied by the pressure products currently on the market, whereas the nonpressure products provide one or more of the primary nutrients. Phosphoric acid is the only liquid fertilizer that supplies phosphoric oxide as a single nutrient, but this nutrient is a constituent of the 2-nutrient and the 3-nutrient products. It appears that potash is seldom, if ever, applied as a single nutrient liquid, but chiefly as a constituent of 3-nutrient fertilizers.

Most of the nonpressure products can be used in all the ways of fertilizer application, i. e., addition to irrigation water, surface and sub-surface soil placements, and, with proper dilution, as foliage sprays, transplant solutions, and seed treatments. The use of the pressure products is limited chiefly, on the other hand, to flood irrigation and to sub-surface soil placement, in the latter case to a depth of at least 4 inches for anhydrous ammonia and 2 inches or more for the low pressure solutions.

Consumption of Nitrogen as Liquid Materials

Since World War II, liquid products have supplied a steadily mounting proportion of the nitrogen in materials used directly as fertilizer (Table 4). Excluding ammonium phosphate solutions, the proportion rose from 8 percent in 1946-47 to 31.6 percent in 1953-54. In the latter year the proportion was 58 percent in Nebraska. Among the other States, it was 51 to 52 percent in

Louisiana, Illinois, and Missouri; 40 to 45 percent in Mississippi, Arkansas, Texas, and Iowa; and 38 percent in California and Washington, for example. For the country as a whole, anhydrous ammonia supplied 7.1 percent of the total nitrogen in all direct application materials in 1946-47, as compared with 26.9 percent in 1953-54. The respective figures for aqueous nitrogen solutions were 0.9 and 4.7 percent. (Table 4)

Some statistics of the annual consumption of nitrogen in liquid forms (anhydrous ammonia and nitrogen solutions) for direct application in 1946-47 to 1953-54 are given in Table 5. In this tabulation the nitrogen solutions are divided into products containing 32 percent or less of nitrogen and those containing more than 32 percent nitrogen. The first group comprises aqua ammonia and aqueous solutions of ammonium nitrate alone or with urea or sodium nitrate. Aqua ammonia currently accounts for the greater portion of the nitrogen in this group. The second group consists essentially of ammoniacal solutions of urea or, chiefly, ammonium nitrate. Neither of these groups includes ammonium phosphate solutions, discussion of which is reserved for the subsequent section on multinutrient liquids. (Table 5)

The total consumption of nitrogen as liquid materials in 1953-54 (337,474 tons) was more than thirteen times the use in 1946-47 (Table 5). Similarly, the consumption of nitrogen as anhydrous ammonia multiplied nearly thirteen-fold, as compared to seventeen-fold for the aqueous solutions. Of the total consumption in 1953-54, 85 percent was in the form of anhydrous ammonia; the proportion in 1946-47 was 88 percent.

In 1946-47 consumption of anhydrous ammonia as a direct application material was confined to three States—Arizona, California, and Mississippi. Use of ammonia in this way was reported for 41 States and Hawaii in 1953-54, i. e., all the States but Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Montana, and Nevada. Except for Montana in 1952-53, no consumption of ammonia has been reported for these seven States in previous years. Some details of the consumption of anhydrous ammonia by States and crops in 1952 and 1952-53 are given in recent papers by Lowe (24, 25).

Use of anhydrous ammonia was initiated in the West South Central region in 1947-48; in the South Atlantic and the East and West North Central regions in 1949-50; and in

the Middle Atlantic region in 1950-51. Its first use in the New England region was a few tons in Connecticut in 1952-53.

Regionally, the consumption of nitrogen as anhydrous ammonia in 1953-54 was highest in the West North Central States, i. e., 69,592 tons or 24.2 percent of the country's total. The quantities and proportions for the East North Central region were 35,835 tons (12.5 percent) and for the East South Central region 45,818 tons (15.9 percent). Thus, these three regions accounted for 52.6 percent of the total consumption.

Prior to 1952-53 the consumption of nitrogen as aqueous solutions was chiefly in California. Regionally, the Pacific States used the largest quantity in 1953-54, 20,107 tons or 40.2 percent of the total for the country. The next highest use (13,126 tons, 26.2 percent) was in the West North Central region.

Facilities for Liquid Nitrogen Materials

As of June 1, 1955, 37 plants for the manufacture of anhydrous ammonia were in operation in the United States (Table 6). These facilities include a small plant in the West, which was not carried in a previous listing (41). The total capacity of these plants is estimated to be approximately 2,865,000 short tons of nitrogen (41). Additional facilities under construction, or scheduled for the immediate future, comprise at least 11 new plants with a total annual capacity of some 680,000 tons of nitrogen. (Table 6)

Anhydrous ammonia plants were located in all the continental regions except the New England and Mountain States, as of June 1, 1955, but one or more plants soon will be in operation in each of the latter regions. Also scheduled for immediate construction is a plant in Puerto Rico, the first of its kind in the Territories. The West South Central region currently leads with 10 plants, and it appears that for the near future the lead will be retained by this region.

The 37 ammonia plants presently in operation are distributed among 21 States, with California holding first place (5 plants). The current construction program will bring 5 additional States into the picture.

Facilities for producing aqua ammonia on a commercial basis are located at 17 of the anhydrous ammonia plants, and 13 of the plants have coexisting facilities for making one or more of the other kinds of nitrogen solutions. Additional facilities for these products will be pro-

vided at the plants under construction. Other facilities for producing aqua ammonia comprise byproduct coke ovens and stations for its preparation from anhydrous ammonia manufactured at other locations. Production of aqua ammonia at any or all of the anhydrous ammonia plants may be done readily, as the occasion may warrant. Production of the other kinds of nitrogen solutions generally is economically feasible, however, only at ammonia plants having coexisting facilities for manufacturing ammonium nitrate or urea.

The use of anhydrous ammonia as a fertilizer is fostered by a national organization and by at least seven State and regional groups located in the North Central and West South Central areas: An association to promote the use of nitrogen solutions was organized recently in the Middle West.

The activities of local distributors and independent applicators undoubtedly have been a highly potent factor in the rapid growth of anhydrous ammonia as a direct application material. It is estimated that in January-June 1954 the gross number of such distributors and applicators, including duplication of those operating in more than one State, totaled 482 (Table 7). Of this number, 171 (the maximum for a region) were in the West North Central States, which was also the leading region in the use of anhydrous ammonia in 1953-54. Other regions having large gross numbers of distributors and applicators, as well as high levels of ammonia use, were the East North Central, East South Central, and West South Central. As to the net number of distributors and applicators in the various States, Iowa led with 90, followed by Mississippi with 50 and Arkansas and Missouri with 37 each. (Table 7)

Information on the number of local distributing stations for anhydrous ammonia is incomplete. It appears, however, that in the January-June period of 1954 there were at least 500 such stations in the West North Central region, 185 in the East North Central region, and 125 in the East South Central region. Among the individual States, 250 to 275 of the stations were located in Iowa, 130 in Illinois, 103 in Nebraska, and 80 in Mississippi. According to Lowe (24), local storage facilities were expected to have a total capacity of about 50 million gallons of anhydrous ammonia, equivalent to approximately 105,000 tons of nitrogen, by the end of 1953. The current



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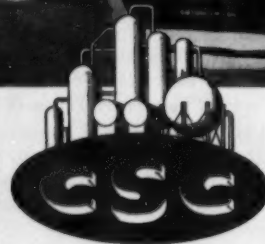


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capacity likely exceeds this figure by a substantial margin.

Characteristics of Liquid Nitrogen Materials

Important characteristics of liquid nitrogen materials, as well as of other liquid fertilizers, in relation to their use for direct application, include nutrient content, vapor pressure, salting-out temperature (temperature at which the liquid becomes solid or begins to deposit salts), corrosive action on containers and equipment, toxicity to human beings and farm animals, and fire and explosion hazard. Only brief mention of these characteristics can be made here.

Liquid ammonia is distinguished from the other liquid nitrogen materials chiefly by its high content of nitrogen (82 percent) and its high vapor pressure (211 p. s. i. g. at 104° F.). Detailed information on its properties and the requirements with respect to containers and equipment for its transportation, storage, and application are set forth in a number of excellent publications, including citations (1, 18, 13, 14, 29, 32, 39). Because of the high pressure of liquid ammonia, constant attention must be given to the condition of containers and equipment and more than ordinary care must be exercised in its transportation and handling, if serious injury to personnel is to be avoided. Fatalities have occurred.

Prolonged exposure to air containing 100 p. p. m. of ammonia is not harmful to most persons, but the breathing of air containing 5,000 to 10,000 p. p. m. of ammonia may cause sudden death (13, 29, 32). In the absence of immediate remedial measures, permanent injury to the eyes may result from exposure to atmospheres containing more than 700 p. p. m. of ammonia. Contact with liquid ammonia can cause severe injury to the skin.

Ammonia is explosive or flammable in air only at comparatively high concentrations (16 to 25 percent by volume). Such concentrations should be scrupulously avoided, especially in repairs to insufficiently vented containers and equipment, whether for liquid ammonia or low pressure solutions, that involve cutting or welding operations.

Publications issued by manufacturers—such as those designated in citations (2) and (38), for example—are often the best and sometimes the only sources of information on the characteristics of aqueous nitrogen materials. As reported in publication of this kind (2), some properties of certain nitrogen solutions

Table 8. Some Properties of Aqueous Nitrogen Fertilizer Materials

Kind of Solution	Nitrogen Content		Gauge Pressure, 104° F.	Salting-Out Temperature
	Total	Volatile NH ₃		
Aqua ammonia (30% NH ₃)	24.71	24.7	11.4	-112
Ammonia-ammonium nitrate	37.0	13.7	1	48
do.	41.0	18.3	10	21
do.	41.0	21.6	17	-25
Ammonia-urea	33.5	21.4	12	18
do.	33.5	28.0	23	-31
Ammonium nitrate	21.0	0	0	47
Ammonium nitrate-urea	32.0	0	0	32
Ammonium nitrate-sodium nitrate	20.0	0	0	58

¹ Other grades of aqua ammonia used for direct application contain 20 to 26% N.

used for direct application are given in Table 8. (Table 8)

A characteristic of the solutions of ammonia with ammonium nitrate or urea is their relatively high content of nitrogen (33.5 to 41 percent). These solutions, like aqua ammonia, contain volatile ammonia (13.7 to 28 percent equivalent nitrogen), and their gauge pressures range from 1 to 23 p. s. i. at 104° F. The temperatures at which salts begin to be deposited from the solutions vary from -31° to 48° F. The nonpressure solutions, which contain ammonium nitrate alone or with urea or sodium nitrate, are characterized generally by lower percentages of nitrogen and higher salting-out temperatures.

Steel containers are suitable for anhydrous and aqua ammonia, but aluminum alloy vessels generally have been the most satisfactory for the other liquid nitrogen materials. Compared to anhydrous ammonia, the aqueous solutions have the advantage that they are less hazardous, are more convenient to store, handle, and apply, and are less subject to loss of nitrogen during the operations involved in their use. In large areas of the country, however, the applied-to-the-soil cost of nitrogen as anhydrous ammonia is below that of solution nitrogen, which, in turn, generally costs less than nitrogen in solid form.

Phosphoric Acid

The consumption of liquid orthophosphoric acid directly as fertilizer totaled 7,971 tons of phosphoric oxide in 1953-54, or 2.5 times that in 1946-47 (Table 9). The Pacific and Mountain regions accounted for all, or nearly all, of the tonnage in each of the years from 1946-47 to 1953-54, and the use was chiefly for addition

to irrigation water, with California and Arizona as the principal consuming States in the respective regions. The Pacific region used 73 percent of the total tonnage in 1946-47 and 63 percent in 1953-54. Currently, there appears to be no marked trend toward either expanded use of phosphoric acid for direct application in the West or extension of this practice eastward. Phosphoric acid usually suffers the disadvantage of a higher delivered cost per unit of phosphoric oxide, compared to that of other sources of the nutrient. (Table 9)

The phosphoric acid used for direct application formerly was manufactured entirely by the sulfuric acid process. Recently, however, acid produced from elemental phosphorus made by the electric furnace process has entered this field (20). The acid, which usually contains 50 to 54 percent of phosphoric oxide, customarily is shipped in rubber-lined steel tank cars or trucks and is stored in steel tanks which are either rubber-lined, plastic-coated, or clad with Type 316 stainless steel (16, 30).

As reported by several investigators (11, 15, 28, 33, 35), chiefly in the West, the value of liquid phosphoric acid as a source of phosphoric oxide for plant nutrition is generally the same as that of other water-soluble forms of this nutrient.

Liquid Mixtures

As commonly used, the term "liquid mixed fertilizer" embraces all multnutrient solutions, whether the nutrients are supplied by a single compound (ammonium phosphate, for example) or by several compounds.

Although information on the consumption of liquid mixtures is in-

Table 9. Liquid Phosphoric Acid Used Directly as Fertilizer in the United States (Short Tons of P₂O₅)

Year Ended June 30	Region			Total
	Pacific	Mountain	Other	
1947	2,396	835	0	3,141
1948	2,461	971	0	3,432
1949	2,064	706	0	2,770
1950	3,470	816	32	4,393
1951	3,696	1,324	412	5,245
1952	7,327	2,329	41	9,671
1953	5,130	2,256	57	7,483
1954	5,016	2,940	38	7,971

complete, estimates based on the most reliable information available at this time indicate that the use of such mixtures totaled some 27,500 tons in 1953-54 (Table 10), of which about 81 percent was in the Pacific region. This tonnage relates to products marketed in liquid form by the manufacturers. Excluded, in so far as possible, are products sold in solid form for conversion into solutions by the consumer. Besides the Pacific States, the East North Central, West South Central, and Mountain regions were the only areas in which the consumption exceeded 1,000 tons. These four areas accounted for more than 95 percent of the total use. Since considerable additional capacity for manufacture of liquid mixtures has come into production since June 30, 1954, especially in the Pacific and Middle Western areas, the consumption of such mixtures in 1954-55 was undoubtedly much higher than in the preceding year.

Table 10. Consumption of Liquid Mixed Fertilizers in the Continental United States, Year Ended June 30, 1954¹

Region	Quantity		Portion of Total
	Short Tons	Percent	
New England	91	0.3	
Middle Atlantic	229	0.8	
South Atlantic	161	0.6	
East North Central	1,879	6.8	
West North Central	412	1.5	
East South Central	117	0.4	
West South Central	1,385	5.0	
Mountain	1,035	3.8	
Pacific	22,239	80.7	
United States	27,548	100.0 ²	

¹ The data are from State reports and U. S. Department of Agriculture surveys; they include ammonium phosphates.

² Differs from sum of individual figures because of rounding.

The consumption of liquid mixtures in California in 1953-54 was 20,854 tons, or 75 percent of the country's total, as compared with 1,262 tons (4.6 percent) in Texas (Table 11). As reported elsewhere (31, 37), the consumption was 1,500 tons in Washington, the only other State in which it exceeded 1,000 tons. Except for California, Texas (since 1946-47), and Arizona (since 1951) no data are available on the use of liquid mixtures prior to 1953-54. From 5,405 tons in 1945-46, the consumption of such mixtures in California rose steadily to 21,302 tons in 1952-53 but decreased slightly in the next year. The annual consumption in Texas has been near 1,200 tons since 1948-49. In 1953-54, liquid mixtures were used in the District of Columbia and all the States except Nevada.

Liquid mixtures comprised about 9 percent of the total tonnage of

Table 11. Consumption of Liquid Mixed Fertilizers in California and Texas¹ (Short Tons of Material)

Year Ended June 30	California	Texas	Total
1946	5,405	(2)	5,405 ²
1947	6,507	(2)	6,507 ²
1948	8,329	497	8,826
1949	9,307	834	10,141
1950	7,437	1,273	8,710
1951	11,131	1,269	12,400
1952	15,997	1,033	17,030
1953	21,302	1,401	22,703
1954	20,854	1,262	21,916

¹ The data are from State reports; they include ammonium phosphate solutions.

² No data.

³ California only.

mixed fertilizer used in California in 1953-54. The proportion was 5 percent in Washington, 0.4 percent in Texas, and 0.18 percent in the continental United States.

According to Slack (37), there were 144 plants for producing liquid mixtures in the continental United States as of April 1955, of which 76 were in the Pacific region and 25 in the East North Central States. Plants manufacturing mixtures for bulk distribution accounted for nearly half of the facilities, while the others made packaged specialty products.

Products containing all three of the primary nutrients comprised slightly more than half of the 114 grades of liquid mixtures used in 1953-54 (31). Most of the other grades supplied only nitrogen and phosphoric oxide. The grades most widely used were 5-10-5, 7-14-7, 8-16-8, 10-5-5, and 15-10-5. Sixty-seven grades were sold in California, the largest number among the States.

The merits of liquid mixtures, the potentialities of their use, and the problems encountered in their manufacture, distribution, and application have been discussed in a number of recent articles (6, 7, 12, 19, 20, 21, 26, 27, 31, 37, 40). Only brief mention of these matters can be made here.

From the manufacturer's viewpoint, production of liquid mixtures, as compared with solid products, generally has the advantage of lower capital investment and labor costs, and it enables him to cope more effectively with the problems of physical condition and uniformity of composition. On the other hand, the requirement of a high degree of solubility in water greatly restricts the choice of nutrient materials, especially those supplying phosphoric oxide, and severely limits the addition of secondary and trace nutrients. Furthermore, the grades and concentrations of the mixtures that can be marketed from a given plant

must be confined to those that will not deposit solids at the temperatures likely to be encountered after the mixtures leave the factory. Other problems include corrosion of equipment and the storage of materials and products.

Large supplies of low-cost nitrogen and potash materials, suitable for the manufacture of liquid mixtures, are readily available in practically all parts of the country. This is not true, however, of the readily soluble carriers of phosphoric oxide. For low-cost production of mixtures containing this nutrient the use of liquid phosphoric acid generally is indicated. The acid currently available to many liquid fertilizer manufacturers is largely the surplus from electric furnace operations which produce it primarily for more profitable outlets. Since it is doubtful that furnace acid can be made at a sufficiently low cost to permit the operation of plants for the sole purpose of supplying this material to the fertilizer industry, it appears that production of liquid mixtures in large volume will necessitate recourse to other sources of acid. Major attention should be given to the production and marketing of wet-process phosphoric acid of suitable quality for the preparation of liquid mixtures and for use in other phases of the fertilizer industry.

From the farmer's viewpoint liquid mixtures have the advantage of convenience in handling and application, but his choice of liquids over solids will be governed chiefly by the applied-to-the-soil cost per unit of nutrients in the two forms. Liquid and solid mixtures of similar composition, as regards the kind and quantity of nutrient materials, appear, in general, to be equally effective for the nutrition and production of crops.

Outlook for Liquid Fertilizers

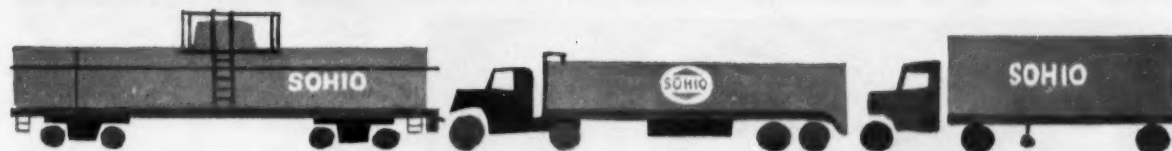
Further expansion in the use of low-cost liquid nitrogen materials (anhydrous ammonia, and low pressure and nonpressure solutions) may be expected. Since the problems in storing, handling, and applying the solutions are less complicated than those encountered with anhydrous ammonia, and the areas in which the solutions might be used advantageously are numerous and large, it may be expected that use of solutions will increase at a more rapid rate than anhydrous ammonia.

It is unlikely that phosphoric acid will gain much prominence as a material for direct application. Since phosphoric acid generally has no advantage over other lower-cost

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water-soluble forms of phosphoric oxide, its use probably will continue to be restricted chiefly as a convenient additive to irrigation water.

Prediction of the future status of liquid mixtures carries some hazards, for their production and marketing are just beginning to assume promising proportions. The level to which their use may ultimately rise will depend chiefly, do doubt, on the extent to which the unit applied-to-the-soil cost of the nutrients is competitive with that of solid mixtures. This assumes that supplies of phosphoric acid of suitable quality will not be a limiting factor.

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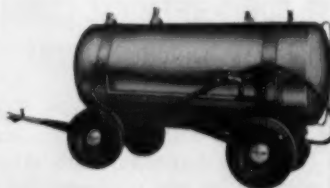
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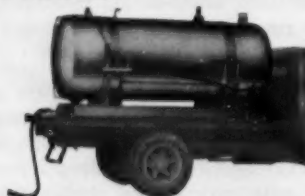
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Manufacture of Liquid Fertilizers

Early liquid mixed-fertilizers were highly acidic solutions made by the dissolution of ammonium nitrate and potassium chloride in phosphoric acid. They did not become popular because of the handling problems caused by their corrosive nature. These solutions were added almost exclusively to irrigation waters.

Recently the use of liquid-mixed-fertilizers has become increasingly popular in many parts of the country. Neutral solutions are now being manufactured which can be handled without serious corrosion problems. These solutions are formulated to give products which are comparable in analysis to many of the popular dry mixed-fertilizers found on the market today. For example, 100 pounds, or about 10 gallons, of a liquid fertilizer having a 5-10-5 analysis contains the same quantity of nutrient as 100 pounds of a dry, solid product with the same nutrient analysis.

The liquid fertilizers described here may be defined as essentially neutral aqueous solutions containing the dissolved primary plant nutrients nitrogen, phosphorus pentoxide and potash. Detailed information is presented concerning the raw materials, compositions, densities, pH values and crystallization temperatures of liquid formulations having several different popular base ratios. Two general methods for the manufacture of liquid fertilizers are described.

METHODS OF MANUFACTURE

Simple Dissolution Process

The manufacture of liquid fertilizers by this process involves merely dissolving the necessary solid-form nutrient sources such as ammonium phosphates, urea or ammonium nitrate, and potassium chloride in water.

For example, a 4000 gallon mild steel or wooden tank can be used to make approximately 20 tons of liquid fertilizer every 6 to 8 hours, or in peak season a total of 80 tons per day. Since all the raw materials except water are solids they can be introduced by breaking either 100 or 80 pound bags into the feed hopper. The water input is controlled by me-

tering through a volume meter or more simply by a free board on the mixing tank. Since the dissolution of the solids in water is endothermic it is desirable to have some method for introducing heat into the mixing system in order to increase the rate of dissolution. A hot water or steam heat exchanger constructed of mild steel can be used to keep the temperature of the mix at about 70°F. Either wood or mild steel tanks can be used for product storage.

The simple-dissolution method is of particular advantage in that it requires a minimum of capital investment. The main disadvantage, however, lies in the raw material cost: ammonium phosphates are about half again as expensive as the components purchased in the form of anhydrous ammonia and 75% furnace-grade phosphoric acid.

Acid-Neutralization Method

The manufacture of liquid fertilizers by neutralization involves the addition of anhydrous or aqueous ammonia or ammonia-ammonium nitrate liquors to a phosphoric acid-water mixture followed by the dissolution of urea or ammonium nitrate (for solutions of high nitrogen content) and potassium chloride as

Composition and Physical Property Data for Liquid Fertilizer Formulations

Raw materials to be used when employing SIMPLE DISSOLUTION method of manufacture

Base Ratio	1- 1- 1	1- 1- 1	1- 1- 1	1- 1- 1	1- 1- 1	1- 2- 1	1- 2- 1	1- 2- 2	1- 2- 2
Analysis (N-P ₂ O ₅ -K ₂ O)	10-10-10	9- 9- 9	9- 9- 9	8- 8- 8	8- 8- 8	5-10- 5	5-10- 5	5-10-10	5-10-10
Raw Materials:									
Monoammonium phosphate	4.46	4.01	4.01	3.57	3.57	4.46	4.46	4.46	4.46
Diammonium phosphate	13.67	12.30	12.30	10.93	10.93	13.67	13.67	13.67	13.67
Urea	14.83	13.28	.....	11.74	.....	3.85	.....	3.85	.....
Ammonium nitrate	.....	.....	17.45	.....	15.41	.....	5.06	.....	5.06
Potassium chloride	16.16	14.54	14.54	12.92	12.92	8.08	8.08	16.16	16.16
Water	50.08	55.87	51.70	60.84	57.17	69.94	68.73	61.86	60.65
Physical Properties:									
pH (1-10 dilution)	7.3	7.3	7.2	7.3	7.2	7.2	7.1	7.3	7.2
Density (lbs./gal.)	10.6	10.3	10.7	10.1	10.4	9.83	9.92	10.3	10.4
Cryst. Temp. (°F.)	54	-2	72	-8	66	11	9	22	30
Base Ratio	2- 1- 1	2- 1- 1	2- 2- 1	2- 2- 1	3- 2- 1	3- 2- 1	1- 3- 3	1- 3- 1	1- 3- 0
Analysis (N-P ₂ O ₅ -K ₂ O)	10- 5- 5	10- 5- 5	10-10- 5	10-10- 5	12- 8- 4	12- 8- 4	3- 9- 9	6-18- 6	8-24- 0
Raw Materials:									
Monoammonium phosphate	4.32	4.32	4.46	4.46	3.57	3.57	4.01	8.03	11.50
Diammonium phosphate	4.44	4.44	13.67	13.67	10.93	10.93	12.32	24.60	31.80
Urea	18.87	.....	14.83	.....	20.50	.....	.....	.....	.....
Ammonium nitrate	.....	24.80	.....	19.49	.....	27.00	.....	.....	.....
Potassium chloride	8.08	8.03	8.08	8.08	6.46	6.46	14.54	9.70	.....
Water	64.29	58.36	52.96	54.30	58.54	52.04	69.13	57.67	56.70
Physical Properties:									
pH (1-10 dilution)	7.8	6.7	7.4	7.0	7.2	7.2	7.3	7.2	7.0
Density (lbs./gal.)	9.68	10.2	10.1	10.5	9.93	10.2	9.85	10.6	10.5
Cryst. Temp. (°F.)	3	32	2	40	4	30	5	7	32

required by the formulation.

The equipment required for this process is slightly more complicated and more expensive than that required for the simple-dissolution process since stainless steel or rubber-lined mild steel tanks are required for the mixing step. Further, the storage of liquid raw materials such as anhydrous ammonia and phosphoric acid requires special types of tanks which increase the capital investment.

Newer pilot plant operations do away with some of the more expensive equipment usually required when liquid anhydrous ammonia is used. Liquid ammonia is introduced directly into the reaction tank thus eliminating the need for ammonia vaporizing equipment. Since most of the heat liberated is dissipated by boiling, a further reduction in capital costs may be achieved by omission of cooling devices. However, some cooling may be necessary in order to facilitate further handling and storage of the finished product, especially in larger operations.

Phosphoric acid and water are weighed separately into a 40-gallon stainless steel weigh-tank and gravity-fed to a 300-gallon stainless steel reactor equipped with a one-half

horsepower agitator. The required quantities of these raw materials might be obtained by metering rather than weighing.

Anhydrous liquid ammonia is introduced into the reactor from a cylinder through spargers mounted through the side of the reactor tank at a position just above the dish shaped bottom of the reactor. The pilot unit is equipped with two spargers and an air purging line, which is used at the end of the ammoniation cycle to remove liquid ammonia from the lines between the ammonia cylinder and the reactor tank. A hydraulic hose is used as the flexible connection between the reaction tank and the ammonia reservoir. The amount of liquid ammonia fed into the reactor is controlled by a series of valves and measured by a platform scale on which the ammonia tank is placed horizontally so that ammonia liquid can be drawn from the tank.

After the ammoniation process the solid raw materials are added to the open reactor and, after complete dissolution, the liquid fertilizer is pumped through a filter to storage drums. The filter is necessary only when raw materials are used that have some insoluble content. This

type pilot unit is capable of producing a 1.5 ton batch every 30 minutes for a total of 24 tons per eight-hour day.

Aqueous ammonia can be used in lieu of anhydrous ammonia, and has some advantage over anhydrous ammonia because of the slightly smaller quantity of heat liberated. Actually, the heat absorbed in the vaporization step is slightly less than the heat given off during the solution of the gaseous ammonia, hence a slightly larger quantity of heat is liberated when liquid anhydrous ammonia is used for the neutralization.

The ammoniation of the phosphoric acid is carried out over a range of elevated temperatures depending on several factors. With some formulations in which all of the nitrogen is derived from ammonia, the boiling point of the solution is reached before the ammoniation is complete, for example, a 6-18-6 liquid fertilizer. The boiling temperature of this solution is reached after the ammoniation is about 75 percent complete, and the heat is dissipated by boiling. The solution cools to about 160°F. with the addition of the potassium chloride.

The results show that the absorp-

Composition and Crystallization Data for Liquid Fertilizer Formulations
(using ACID NEUTRALIZATION process)

Base Ratio	1- 1- 1	1- 1- 1	1- 1- 1	1- 2- 1	1- 2- 2	1- 2- 2	2- 1- 1	3- 2- 1	1- 3- 3
Analysis (N-P ₂ O ₅ -K ₂ O)	10-10-10	9- 9- 9	8- 8- 8	5-10- 5	5-10-10	5-10-10	10- 5- 5	12- 8- 4	3- 9- 9
Raw Materials:									
Aqueous ammonia (29.6%)	(13.65)*	(12.30)*	(10.91)*	(13.65)*	(13.65)*	(13.65)*	(6.82)*	(10.91)*	(12.47)*
Anhydrous ammonia	4.04	3.64	3.23	4.04	4.04	4.04	2.02	3.23	3.69
Phosphoric acid (75%)	18.53	16.68	14.83	18.53	18.53	18.53	9.27	14.83	16.68
Urea	14.80	13.33	11.85	.....	3.83	.....	.....	.....	.....
Ammonium nitrate	.....	.....	.....	5.03	.....	5.03	24.17	27.11	.....
Potassium chloride	16.16	14.54	12.93	8.08	16.16	16.16	8.08	6.46	14.54
Water	(36.86)*	(43.15)*	(49.48)*	(54.71)*	(47.83)*	(46.63)*	(51.66)*	(40.69)*	(56.31)*
Water	46.47	51.81	57.16	64.32	57.44	56.24	56.46	48.37	65.09
Crystallization Data:									
Cryst. Temp. (°F.)	64	13	0	9	22	30	32	30	5
Crystalline phase	KCl	KCl	KCl	KNO ₃	KCl	KNO ₃	KNO ₃	KNO ₃	KCl
Base Ratio	1- 3- 1	1- 3- 0	1- 1- 1	1- 1- 1	1- 2- 2	1- 2- 1	2- 2- 1	3- 2- 1	1- 3- 1
Analysis (N-P ₂ O ₅ -K ₂ O)	6-18- 6	8-24- 0	9- 9- 9	8- 8- 8	5-10-10	5-10- 5	10-10- 5	12- 8- 4	6-18- 6
Raw Materials:									
Aqueous ammonia (29.6%)	(24.90)*	(33.21)*	(12.30)*	(10.91)*	(13.65)*	(13.65)*	(13.65)*	(10.91)*	(24.90)*
Anhydrous ammonia	7.37	9.83	3.64	3.27	4.00	4.00	4.00	3.27	7.37
Phosphoric acid (75%)	33.36	44.48	16.68	14.83	18.53	18.53	18.53	14.83	33.36
Urea-ammonium nitrate solution**	.....	.....	19.10	16.97	5.44	5.44	21.22	29.39	.....
Potassium chloride	9.70	.....	14.54	12.92	16.16	8.08	8.08	6.46	9.70
Water	(32.04)*	(22.31)*	(37.38)*	(44.37)*	(46.22)*	(54.30)*	(38.52)*	(38.21)*	(32.04)*
Water	49.57	45.69	46.04	52.05	55.83	63.91	48.13	45.89	49.57
Crystallization Data:									
Cryst. Temp. (°F.)	7	23	50	40	26	10	10	10	7
Crystalline phase	DAP	DAP	KNO ₃	KNO ₃	KCl	KNO ₃	KNO ₃	KNO ₃	DAP

* When using the aqueous ammonia value, omit the anhydrous ammonia value and use the water value in parenthesis. The other raw material values are the same whether using aqueous or anhydrous ammonia. The density for the formulations is approximately ten pounds per gallon.

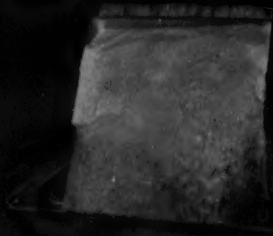
** In compiling data, the experiments were made with urea-ammonium nitrate solution "Uran" (trade mark registered, Nitrogen Division, Allied Chemical & Dye Corp.)

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Monsanto Concentrated Liquid Fertilizer Nutrients

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Monoammonium Phosphate (12.2-61.6-00.0)
75% Phosphoric Acid..... (00.0-54.5-00.0)
Dipotassium Phosphate... (00.0-39.9-53.0)
Monopotassium Phosphate (00.0-51.6-34.2)

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tion of liquid anhydrous ammonia is essentially complete. No ammonia loss is observed over the solutions which do not reach the boiling point during the ammoniation. Further, the ammonia odor was first detected over the solutions that do boil after the ammoniation was about 90 percent complete. Less than 1% ammonia was lost from these formulations which were allowed to boil to dissipate the heat.

FORMULATION OF LIQUID FERTILIZERS

Essential Physical Properties

The principal physical properties of liquid fertilizer formulations which must be considered are solubility (crystallizing temperature), pH value, odor and density.

The various nutrients should be completely soluble not only at room temperature (70°F.) but also at freezing temperatures. Since there is no way for accurately predicting mutual solubility of the nutrient sources, all potential liquid formulas must be tested in the laboratory. The following general relationships should be kept in mind.

1. The higher the total nutrient value (sum of N, P₂O₅ and K₂O values) the higher the crystallizing temperature.

2. The presence of unneutralized ammonia in a formulation markedly reduces the solubility of the ammonium phosphates. Particular attention should be given to the degree of neutralization when ammonia-ammonium nitrate liquors are used as the nitrogen source.

3. Increased potash generally decreases the maximum total nutrient concentration that can be obtained.

The pH value of the formulations at a one to ten dilution (one volume of liquid fertilizer to nine volumes of water) should lie in the range of 6.0 to 8.0. Solutions with pH values below 6 are likely to cause corrosion of mild steel storage containers and application equipment, whereas solutions with pH values above 8 are likely to have an ammonia odor. Ammonia odor generally should be avoided since it is possible that the user may feel that he is losing nitrogen from the solution even though the loss may be vanishingly small. Further free ammonia in the solution results in decreased nutrient solubility. Since the density of these formulations is generally greater than 9.5 pounds per gallon at least 500 pounds can be shipped in a 55-gallon drum.

General Rules for Formulating Liquid Fertilizers

The following general rules, based

on experiment and experience, have been established as guide posts in calculating the composition of a liquid fertilizer:

1. A total nutrient content greater than 30 percent can rarely be achieved. Most liquid fertilizers average about 25 to 30 percent total nutrient content.

2. The P₂O₅ content is derived from phosphoric acid or a combination of mono- and diammonium phosphates depending on the method of manufacture used.

3. Since ammonia is the cheapest source of nitrogen, it is desirable to use the maximum amount that is compatible in any given formulation. Generally, when ammoniating phosphoric acid a maximum of 4.0 pounds of anhydrous ammonia (or its equivalent as aqueous ammonia) per 10 pounds of P₂O₅ can be used without the danger of residual ammonia odor. This value corresponds to 3.3 pounds of nitrogen. A minimum of 3.2 pounds of anhydrous ammonia or 2.6 pounds of nitrogen per 10 pounds of P₂O₅ must be used in order to insure a pH value at a 1 to 10 dilution of at least 6.

4. When an aqueous ammonia-ammonium nitrate solution is used as the nitrogen source, the amount to be used is limited by the free ammonia content. The same maximum and minimum free ammonia to P₂O₅ values apply as set down in item 3 above.

5. When monoammonium and diammonium phosphates mixtures are used, as in the simple dissolution process, never more than 85 percent nor less than 35 percent of the P₂O₅ should be derived from monoammonium phosphate. If more than 85% of the P₂O₅ is derived from monoammonium phosphate the solution will be more acidic than desired, and if less than 35 percent is used the solution will have an ammonia odor.

6. Supplementary nitrogen, or nitrogen needed in addition to that supplied by ammoniation or ammonium phosphates, can be supplied as urea or ammonium nitrate. Urea is preferred over ammonium nitrate because lower crystallizing temperatures are realized by its use. Further, urea can be stored and handled without particular regard to hazard from fire and explosion, whereas ammonium nitrate requires special safety measures.

7. Potassium chloride is almost always used as the potassium source. Potassium sulfate may be substituted for the potassium chloride in special formulations. Potassium nitrate is sometimes used but generally does not prove economical because of the high cost per unit of total nutrient value.

The Year Book is indebted to Monsanto Chemical Company for the material presented in this section on manufacture of liquid fertilizers. The text and tables on pages 103 and 107, were drawn from a paper "The Manufacture and Properties of Liquid Fertilizers," prepared by their Peter G. Arvan, Robert P. Langguth and Charles C. Stielor for presentation to the American Chemical Society at its September, 1954 meeting. The table on page 104 was extracted from Monsanto's booklet "Formulating Complete Liquid Fertilizers."

Material Selections for Liquid Fertilizers

Although a great variety of raw materials may be used in the formulation of liquid fertilizers, consideration of such factors as solubility in water, availability, cost and nutrient concentration suggest the preference of specific raw materials. These materials, with their minimum guaranteed analysis, are given below:

Raw Materials for Liquid Fertilizer Manufacture	
Raw material	Minimum guaranteed analysis (N-P ₂ O ₅ -K ₂ O)
Furnace-grade phosphoric acid (75%)	0-54.5-0
Anhydrous ammonia	82-0-0
Diammonium phosphate	21-53.8-0
Urea	46-0-0
Aqueous ammonia solution	(20-24)-0-0
Ammonia-ammonium nitrate solutions	40.8-0-0 and others
Monoammonium phosphate	12.1-61.6-0
Ammonium nitrate	35-0-0
Potassium chloride	0-0-62.5

Potassium chloride, ammonium nitrate and urea can be obtained in inferior grades (for example, muriate of potash, 60% K₂O), but these grades are generally not used because of their insoluble content.

Other common nutrient sources and the reasons which preclude their use as liquid-fertilizer raw materials are given below:

Raw Materials Not Acceptable for Liquid Fertilizer Manufacture

Raw material	Reason for excluding as nutrient source
Ammonium sulfate—low nutrient content	
Sodium nitrate—low nutrient content and high cost	
Calcium nitrate—incompatible in the presence of ortho-P ₂ O ₅ and high cost per unit of nitrogen	
Superphosphate (normal or triple)—not completely soluble in water	
Wet-process phosphoric acid—contains large quantities of water-insoluble materials and impurities which would precipitate on ammoniation, requiring other than ordinary filtration methods to remove them due to their highly gelatinous nature.	
Calcium phosphates—insoluble in water	
Sodium phosphates—high sodium content agronomically undesirable, and high cost per unit of P ₂ O ₅ compared to phosphoric acid.	
Potassium nitrate—high cost per unit of total nutrient content	
Potassium phosphates—high cost per unit of total nutrient content	
Potassium sulfate—high cost per unit of potash compared to potassium chloride, and not generally available	

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Alphabetical Directory of Fertilizer Manufacturers

If a manufacturer has more than one location, the main office is listed immediately after the company name, followed by the listing of branch locations.

Following this department is a Directory of Fertilizer Manufacturers, listed geographically, giving detail as to plants, personnel and products.

A

AFC, Inc., Edison, Calif.
Acme Fertilizer Co., Wilmington & Acme, N. C.
Activated Fertilizer Corp. of Washington, Spokane, Wash.
A. D. Adair & McCarty Bros., Inc., Atlanta & East Point, Ga.; Chattanooga & Gray, Tenn.
ADCO Works, Carlisle, Pa.
R. L. Aggeler Coal & Fertilizer Co., Boonville, Mo.
Agri-Chem of Texas, Inc., San Antonio, Texas
Agricultural Chemical & Supply Co., Geneva, Nebr.
Agricultural Chemicals, Inc., Llano, Lubbock & Henderson, Texas
Agricultural Chemicals, Ltd., Fort Chambly, Que., & Port Hope, Ont., Canada
Agricultural Processing Industries, Inc., Denver, Colo.
Agricultural Products Co., Inc., Anthony, N. M.
Agricultural Products Corp., Webster City & Highview, Iowa
Agricultural Services, Inc., Blackfoot, Idaho
Agriform Co., Inc., Santa Ana, Holtville, Wasco & Woodland, Calif.; Yuma, Ariz.
Agro Phosphate Co., Visalia, Calif.
Agsco Chemicals, Inc., Grand Forks, N. D.
Ahlswede Fertilizer Co., Riverside, Calif.
Aiken Fertilizer Co., Aiken, S. C.
Alabama Oil & Guano Co., Opelika, Ala.
Alabama Warehouse Co., Inc., Troy, Ala.
Alaska Fertilizer Co., Seattle, Wash.
Albany Warehouse Co., Albany, Ga.
Alfco Liquid Fertilizer Co., Charlotte, N. C.
Algoma Steel Corp., Ltd., Sault Ste. Marie, Ont., Canada
Allen Co., Pittstown, N. J.
Allendale Fertilizer Co., Allendale, S. C.
Allerton Fertilizer Co., Allerton, Illinois
Alliance Fertilizer Corp., Ellerson & Milford, Va.
Allied Chemical & Dye Corp. (See Nitrogen Div.)
All State Fertilizer Co., Greenwood, Miss.
The American Agricultural Chemical Co., New York, N. Y.; Montgomery, Ala.; Pensacola & Pierce, Fla.; Savannah, Ga.; Fulton & National Stock Yards, Ill.; Humboldt, Iowa; Searsport, Maine; Baltimore, Md.; No. Weymouth, Mass.; Detroit & Saginaw, Mich.; Carteret, N. J.; Buffalo & Phoenix, N. Y.; Greensboro & Henderson, N. C.; Cairo, Cincinnati, Cleveland & Washington Court House, Ohio; Charleston, Columbia & Spartanburg, S. C.; Alexandria & South Norfolk, Va.; Port Hope, Ont., & Ft. Chambly, Que., Can.; Havana, Cuba
American Brand Fertilizer Co., Hobart & E. Chicago, Ind.
American Chemical Paint Co., Ambler, Pa.
American Corp., Terminal Island, Calif.
American Cyanamid Co., New York, N. Y.; Brewster, Fla.; Warners, N. J.; Niagara Falls & Port Robinson, Ont., Can.
American Liquid Fertilizer Co., Inc., Marietta, Ohio
American Phosphate Co., St. Louis, Mo.
American Potash & Chemical Corp., Los Angeles & Trona, Calif.; San Antonio, Texas
American Oil Co., Americus, Ga.
The Anaconda Co., Fertilizer Dept., Anaconda, Mont.
Anderson Fertilizer Co., Inc., Anderson, S. C.
Anderson Guano Co., Timmonsville, S. C.
Apco Fertilizer Co., Halls, Tenn.
Apothecaries Hall Co., Waterbury & East Windsor, Conn.
Arcadia Cotton Oil Co., Inc., Arcadia, La.
The Arical Co., Inc.

Arizona Fertilizers, Inc., Phoenix, Ariz.; Toltec & Yuma, Ariz.
Arizona Plant Food Corp., Glendale, Ariz.
Ark-La Feed & Fertilizer Co., Magnolia, Ark.
Ark-Mo Plant Food Co., Inc., Corning, Ark.; Walnut Ridge, Ark.
Arkansas Plant Food Co., N. Little Rock, Ark.
Arlington Manufacturing Co., Arlington, Ga.
Arlington Peanut & Fertilizer Co., Arlington, Ga.
Armour & Co., S. A., Fertilizer Dept., Havana & Matanzas, Cuba.
Armour Fertilizer Works, Atlanta, Ga.; Birmingham & Montgomery, Ala.; Bartow & Jacksonville, Fla.; Albany, Augusta & Columbus, Ga.; Chicago Heights & East St. Louis, Ill.; Jefferson, Ind.; Waterloo, Iowa; New Orleans, La.; Presque Isle, Me.; Baltimore, Md.; Winona, Minn.; North Kansas City, Mo.; Carteret, N. J.; Greensboro & Navassa, N. C.; Cincinnati & Sandusky, Ohio; Columbia, S. C.; Columbia, Memphis & Nashville, Tenn.; Dallas & Houston, Texas; Norfolk, Va.; San Juan, P. R.; Havana & Matanzas, Cuba.
H. M. Arnold Fertilizer Co., Monroe, Ga.
Aroostook Federation of Farmers, Caribou, Ft. Kent & Sherman, Maine
Aroostook Hi-Test Fertilizer Co., Presque Isle, Maine
Ashkum Fertilizer Co., Ashkum, Ill.
Associated Chemicals, Salinas, Calif.
Atlanta Chemical Co., Atlanta, Ga.
Atlantic Fertilizer Corp., Riverhead & Jamesport, N. Y.
Atlas Fish Fertilizer Co., San Francisco, Calif.
Atmar Distributing Co., Inc., Yuma, Ariz.
The Atwater Co., Locke, N. Y.
Auburn Fertilizer Co., Auburn, Nebr.
Augusta Fertilizer Co., Augusta, Ga.
Aylward Fertilizer Co., Sullivan & El Paso, Ill.

B

B. & W. Inc., Edison, Calif.
Bactex Co., Inc., San Antonio, Texas
The Baker Castor Oil Co., New York, N. Y.; Los Angeles, Calif.; Bayonne & Jersey City, N. J.
Ball Fertilizer Co., Elizabeth City, N. C.
Bandini Fertilizer Co., Los Angeles, Calif.
Banks Fertilizer Co., St. Matthews, S. C.
The F. A. Bartlett Tree Expert Co., Stamford, Conn.
Bartlett & O'Bryan Fertilizer Co., Owensboro, Ky.
Batesburg Fertilizer Co., Batesburg, S. C.
J. E. Bauknight, Jr., Walhalla, S. C.
The Baugh & Sons Co., Inc., Baltimore, Md.; Coxsackie, Newark & Oneida, N. Y.; New Bern, N. C.; Canton & Fostoria, Ohio; Philadelphia, Pa.; Portsmouth, Va.
The Baugh Chemical Co., Baltimore, Md.
D. A. Beam Co., Shelby, N. C.
Bell Fertilizer Co., Columbia, Ala.
Bennett Chemical Co., Denver, Colo.
Bennett & Clayton Co., Inc., Prospect Plains, N. J.
Bennett-Mount Co., Hightstown, N. J.
Benson-Maclean, Bridgeton, Indiana
Berrien Products Co., Inc., Nashville, Ga.
The Best Fertilizers Co., Oakland & Lathrop, Calif.
The Best Fertilizers Co. of Texas, Houston, Texas
Bioproducts, Oregon, Ltd., Warrenton, Oreg.
The Blackshear Manufacturing Co., Blackshear, Ga.

Blackstone Guano Co., Inc., Blackstone, Va.
 Blount Fertilizer Co., Greenville, N. C.
 Blue Belt Fertilizer Co., Savannah, Ga.
 Blue Grass Plant Food, Inc., Cynthia & Danville, Ky.
 Blue Valley Fertilizer Co., Inc., Marysville, Kansas
 Blytheville Fertilizer Co., Inc., Blytheville, Ark.
 F. W. Bolgiano & Co., Washington, D. C.; Landover, Md.
 Bone Dry Fertilizer Co., Richmond, Va.
 Boone Soil Service Co., Belvidere, Ill.
 Boonville Mill & Grain Co., Boonville, Mo.
 Boyer Fertilizer Corp., Ft. Worth, Texas
 Boyer Fertilizer Service, Watsonville, Calif.
 W. B. Boyle Co., Sumter, S. C.
 Bradley & Boswell, Ellersburg, Va.
 W. C. Bradley Co., Columbus, Ga.
 Brea Chemicals, Inc., Los Angeles & Brea, Calif.
 A. A. Britt Fertilizer Co., Thomaston, Ga.
 Britz Chemical Co., Oakland, Calif.
 W. Brotherton Seed Co., Ellensburg, Wash.
 Brown & Bryant, Shafter, Calif.
 Brown Fertilizer Co., Inc., Blackville, S. C.
 Brown Floral Co., Salt Lake City, Utah
 Bryan Cotton Oil & Fertilizer Co., Bryan, Texas
 Herbert Bryant, Inc., Alexandria, Va.
 Bryant's, Inc., Bartow, Ga.
 The Buhner Fertilizer Co., Inc., Seymour, Ind.; Danville, Ill.
 Bunkie Phosphate Co., Bunkie, La.
 Burdette Mill & Gin Co., Washington, Ga.
 Burley Belt Plant Food Works, Lexington, Ky.
 Burlington Rendering Co., Burlington, Vt.
 Burns and Co., Ltd., Calgary & Edmonton, Alta.; Vancouver, B. C.; Winnipeg, Man.; Kitchener, Ont.; Prince Albert & Regina, Sask., Canada
 Burr Gin & Fertilizer Co., Cheraw, S. C.

C

CDK Liquid Fertilizer Corp., Kitchel, Ind.
 Cactizona Manufacturing Co., Garden Grove, Calif.
 Cagmar Chemical Co., Santa Clara, Calif.
 Caldwell's, Inc., Spartanburg, S. C.
 California Liquid Fertilizer Co., Pasadena, Calif.
 California Mor-Life, Inc., Watsonville, Calif.
 California Spray Chemical Co., Richmond, Calif.
 California Sun Fertilizer Co., Los Angeles, Calif.
 The Calumite Corp., Altadena & Stockton, Calif.; New York, N. Y.; Marysville, Utah
 Camilla Cotton Oil Co., Camilla, Ga.
 Camp Chemical Co., Inc., Roxboro, N. C.
 S. A. Camp Fertilizer & Insecticide Co., Cawelo & Shafter, Calif.
 Campbell Fertilizer Co., Houston, Texas
 H. D. Campbell Co., Rochelle, Ill.; Strawberry Point, Iowa
 Canadian Industries (1954) Ltd., Agricultural Chemicals Dept., Montreal, Que.; Halifax, N. S.; Chatham & Hamilton, Ont.; Beloit, Que., Canada
 Canada Packers, Ltd., Fertilizer & Feed Div., Toronto, Ont.; East St. John, N. B.; Port Williams, N. S.; Chatham, Welland & W. Toronto, Ont.; Summerside, P. E. I.; Montreal & Ste. Foy, Que., Canada; Presque Isle, Me., USA
 Cattelou-Law Gin & Warehouse Co., Wetumpka, Ala.
 Capital Feed & Seed Co., Phoenix, Ariz.
 Capital Fertilizer Co., Montgomery, Ala.
 Capitol Fertilizer Co.-Div. National By-Products, Inc., Denver, Colo.
 Carbola Chemical Co., Inc., Natural Bridge, N. Y.
 Carlisle Fertilizer Works, Inc., Carlisle, Pa.
 Carolina Mixing Co., Fairfax, S. C.
 Carr-Boatright, Sandersville, Ga.
 Carroll County Cooperative Supplies Assn., Huntingdon, Tenn.
 Carroll Fertilizer Co., Dublin, Ga.
 Carter Fertilizer Co., Jefferson, Ga.
 Cartledge Fertilizer Co.-Div. Wilson & Toomer Fertilizer Co., Cottondale, Fla.
 A. L. Castle, Inc., Mountain View, Calif.
 Central Chemical Corp., Hagerstown, Md.; Butler, Everett, Gettysburg & Milton, Pa.; Harrisonburg, Va.
 Central Georgia Fertilizer Co., Macon, Ga.
 Central Texas Fertilizer Co., Comanche, Texas
 Central Farmers Co-Op. Inc., Selma, Ala.

Chamberlin & Barclay, Inc., Cranbury, N. J.
 Chase & Co., Sanford, Fla.
 Chatelier Laboratories, St. Petersburg, Fla.
 Chatelier Plant Food, St. Petersburg, Fla.
 Chavala Cooperative, Inc., Phenix City, Ala.
 Chemical Fertilizer Co., Inc., Modesto, Calif.
 Chewsville Co-Operative Assn., Inc., Chewsville, Md.
 Chickasha Cotton Oil Co., Chickasha, Okla.
 Chickamuga Fertilizer Works, Chattanooga, Tenn.
 A. B. Chrisman Grain Co., Meredosia, Ill.
 Cie Nord Africaine de L'Hyperphosphate Reno, (see Williams Houde, Ltd.)
 Cimota Enterprises, Inc., Boise, Idaho
 Circle Manufacturing Co., Social Circle, Ga.
 Citrus Culture Corp., Mount Dora, Fla.
 Clanton Fertilizer Co., Inc., Clanton, Ala.
 Coast Agricultural Fertilizer Co., Pasadena, Calif.
 Coastal Fertilizer Co., Hemmingway, S. C.
 J. T. Cochran Estate, Butler, Ga.
 Coleman Guano Co., Pamplico, S. C.
 Colorado Plant Food Co., Manzanola, Colo.
 Colonial Fertilizer Co., Ltd., Windsor, N. S., Canada
 Commerce Fertilizer Co., Commerce, Ga.
 Commonwealth Fertilizer Co., Inc., Russellville, Ky.
 Consolidated Chemical Industries, Inc., San Francisco, Calif.; Baytown, Houston & Ft. Worth, Tex.; Baton Rouge, La.
 The Consolidated Mining & Smelting Co. of Canada, Ltd., Montreal, Que.; Trail, B. C.; Calgary, Alta.; Kimberly, B. C., Canada
 Consolidated Rendering Co., Boston, Mass.
 Consumers Bagging Co., Inc., Tusculumbia, Ala.
 Consumers Cooperative Assn., Kansas City, Mo.; Eagle Grove, Iowa; S. St. Joseph, Mo.; Muskogee, Okla.
 Consumers Oil & Supply Co., Braymer, Mo.
 Contentnea Guano Co., Wilson, N. C.
 Continental Fertilizer Co., Nevada, Iowa
 Cooperative Abonos Cuba, S. A., Havana, Cuba
 Cooperative Farm Chemicals Assn., Lawrence, Kans.
 Cooperative Fertilizer Service, Inc., Salisbury, N. C.
 Cooperative Fertilizer Service of Baltimore, Inc., Baltimore, Md.
 Cooperative Fertilizer Service of Norfolk, Inc., S. Norfolk, Va.
 Cooperative Fertilizer Service of Richmond, Inc., Richmond & Culpepper, Va.; Louisville & Winchester, Ky.
 Coop. G. L. F. Soil Building Service-Div. Coop. G. L. F. Exchange, Ithaca, N. Y.; Bridgeton, Englishtown, South Kearny & Yardville, N. J.; Albany, Batavia, Big Flats, Bridgehampton, Canastota, Lyons & North Collins, N. Y.; Union City, Pa.
 Cooperative Plant Foods, Inc., Schererville, Ind.
 Cornland Plant Foods, Grinnell, Iowa
 Cornwell Chemical Corp., New York, N. Y. & Cornwells Heights, Pa.
 Coronet Phosphate Co.-Div. Smith-Douglass Co., Inc., Norfolk, Va.; Plant City, Fla.
 The Cotton Producers Association, Atlanta, Adel, Carrollton, Cordele & Savannah, Ga.
 Cotton States Fertilizer Co., Macon, Ga.
 Covington Fertilizer Co., Andalusia, Ala.
 Crane Fertilizer Co., Sacramento, Calif.
 Crawford Chemical Co., Inc., Bartlesville, Okla.
 Crop Service Co., Champaign, Ill.
 Newton Crouch, Griffin, Ga.
 Crown By-Products Co., San Jose, Calif.
 Crown Chemical & Mfg. Co., West Point, Miss.
 Crystal Chemical Co., Inc., South Sioux City, Nebr.
 The W. F. Cullens Fertilizer Co., Camilla, Ga.
 J. E. Culler Fertilizer Co., North, S. C.
 Cumberland Valley Cooperative Assn., Shippensburg, Pa.
 Curry Chemical Div., Phillips Petroleum Co., Scottsbluff, Nebr.
 C. Roy Curtis & Son, Inc., Marion, N. Y.
 Cuthbert Gin Co., Cuthbert, Ga.

D

Dadeville Fertilizer & Gin Co., Dadeville, Ala.
 C. P. Daniel's Sons, Senoia, Ga.
 Darling & Co., Chicago, Cairo & East St. Louis, Ill.; Cedar Rapids, Iowa
 Davies Nitrate Co., New York, N. Y.; Metuchen, N. J.
 Davison Chemical Co.-Div. W. R. Grace & Co., Balti-

more, Md.; Bartow, Ft. Pierce & Jacksonville, Fla.; New Albany, Ind.; Perry, Iowa, Gretna, La.; Curtis Bay, Md.; Lansing, Mich.; Joplin & Trenton, Mo.; Wilmington, N. C.; Alliance, Findlay & Columbus, Ohio; Tulsa, Okla.; Charleston & Spartanburg, S. C.; Nashville, Tenn.

Dawson Compress & Storage Co., Dawson, Ga.
Dayton Coal and Iron Corp., Dayton, Tenn.
Dayton Division Sewage Disposal, Dayton, O.
Dayton Fertilizer Corp., Dayton, N. J.
Decatur Fertilizer Co., Decatur, Ala.
Deep-Root Fertilizer, Inc., Olathe, Kans.
Delta Cotton Oil & Fertilizer Co., Jackson, Miss.
Delta Fertilizer Co., Helena, Ark.
Delta Fertilizer, Inc., Sioux City & Rock Rapids, Ia.
Denmark Fertilizer Co., Denmark, S. C.
D. M. Dew & Sons, Inc., Latta, S. C.
The DeWitt Chemical Co., Kingston, Pa.
Diamond Fertilizer Co., Terra Bella, Calif.
The Diamond Fertilizer Co., Sandusky & Ottawa, Ohio
Diamond R. Fertilizer Co., Winter Garden, Fla.
Dixie Chemical Corp., New Bern, N. C.
Dixie Fertilizer Co., Inc., Shreveport & Baton Rouge, La.
Dixie Guano Co., Inc., Laurinburg, N. C.
Dixie Guano Co., Inc., Suffolk, Va.
Dobson Guano Co., Greer, S. C.
Doggett-Pfeil Co., Springfield, N. J.
Dominion Steel & Coal Corp., Ltd., Montreal, Que., & Sydney, N. S., Canada
Dooley Fertilizer Co., Vienna, Ga.
Dorchester Cotton Oil Co., St. George, S. C.
Dorchester Fertilizer Co., Cambridge, Md.
Doster Guano Co., Rochelle, Ga.
Dothan Guano Co., Dothan, Ala.
Downey Fertilizer Co., Downey, Calif.
Duesterhaus Farm Supply, Quincy, Ill.
Duluth Sewage Disposal Dept., Duluth, Minn.
J. W. Dunn & Co., Seattle, Wash.
Duval Sulphur & Potash Co., Houston & Orchard, Texas; Carlsbad, N. M.

E

Eagle Cotton Oil Co., Meridian, Miss.
East Texas Products Co., Div. Swift & Co., Tyler Texas
Eastern Guano Co., Inc., Fayetteville, N. C.
Eastern States Farmers Exchange, Inc., W. Springfield, Mass.; Wilmington, Del.; Cambridge, Mass.; Kittanning & York, Pa.
Eastover Fertilizer Co., St. Matthews, S. C.
Amos Eby & Company, Paradise, Pa.
Economy Fertilizer Co., Inc., Fort Kent, Maine
Economy Reduction Corp., Buffalo, N. Y.
Edmunds Chemical Co., Albuquerque, N. M.
Effingham Equity, Inc., Effingham, Ill.
El Dorado Fertilizer Co., El Dorado, Ark.
Emco Co., Fresno, Calif.
Epting Distributing Co., Leesville, S. C.
J. H. Erbrich Products Co., Indianapolis, Ind.
Erie Reduction Co., Erie, Pa.
Escambia Bay Chemical Corp., Pace, Fla.
The Espoma Company, Millville, N. J.
Espy Fertilizer Co., Inc., Headland, Ala.
Etheredge Guano Co., Inc., Augusta, Ga.
Etiwan Fertilizer Co., Charleston, S. C.
Eufaula Cotton Oil Co., Eufaula, Ala.
Evans, Reed & Williams, Sylvania, Ga.
Everglades Fertilizer Co., Ft. Lauderdale, Fla.

F

Falls City Fertilizer, Inc., Grand Island & Falls City, Neb.
Farm Belt Fertilizer & Chemical Co., Kansas City, Kans.
The Farm Bureau Cooperative Assn., Inc., Columbus, Alliance, Dayton, Glendale, Marietta & Maumee, Ohio
Farm Bureau Service Co. of Missouri, Inc., Jefferson City & New Florence, Mo.
Farm Bureau Services, Inc., Kalamazoo, Lansing & Saginaw, Mich.
Farm Chemical Co., Longmont, Colo.
Farm Fertilizers, Inc., Omaha, Nebr.
Farm Service, Inc., Opelousas, La.
Farm Services, Covington, Tenn.

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J

J. D. & L. Fertilizer, Inc., Magnet, Nebr.
Jackson Fertilizer Co., Jackson, Miss.
Jacksonville Fertilizer Co., Jacksonville, Texas
Jamison Fertilizer Service, Portland, Oreg.
Jasper County Farm Bureau Co-Op., Rensselaer & Pleasant Ridge, Ind.
Jespersen, Inc., Omaha, Nebr.
Jessup Milling Co., San Francisco, Calif.
Johnson Cotton Co., Dunn, N. C.
Johnson Fertilizer Co., Inc., Griffin, Ga.
Jones Fertilizer Co., Angier, N. C.
J. M. Jordan, Angelus, S. C.
Josey Fertilizer Corp., Wilmington, N. C.

K

Kaiser Steel Corp., Oakland, Calif.
Kansas Agricultural Chemical Co., Inc., Junction City, Kansas
Kansas-Nebraska Fertilizer Co., Wichita, Kans.
Morris Karp & Son, Farmingdale, N. Y.
Kellogg Supply Co., Wilmington & Los Angeles, Calif.
Kelly, Weber & Co., Inc., Lake Charles & Eunice, La.
Kelly-Western Seed Div., Utah Coop. Assn., Salt Lake City, Utah
Kentucky Fertilizer Works, Winchester, Ky.
Kershaw Oil Mill, Kershaw, S. C.
Ketona Chemical Corp., Ketona, Ala.
Kickapoo Fertilizers—Div. Midwestern Phosphate Corp., Hillsboro, Wisc.
Kingsbury & Co., Inc., Indianapolis & Peru, Ind.
Kipfer Chemical Co., Harlingen, Texas
Klein Soil Service, Fowlerville & St. Johns, Mich.
Knoxville Fertilizer Company, Knoxville, Johnson City & Nashville, Tenn.; London, Ky.
Koller Fertilizer Co., Inc., York, Coatesville & Glen Rock, Pa.
The N. S. Koos & Son Co., Kenosha, Wisc.
Kos-Gro Corp., Warsaw, Ind.
Kova Fertilizer, Inc., Greensburg, Ind.

L

Lake Charles Feed Co., Inc., Lake Charles, La.
Lancaster Bone & Fertilizer Co., Quarryville, Ephrata & Oxford, Pa.
Land O'Lakes Creameries, Inc., Minneapolis, Minn.
Lange Brothers, St. Louis, Mo.
La Plata Chemical Co., La Plata, Mo.
Laurel Oil & Fertilizer Co., Laurel, Miss.
Lebanon Chemical Corp., Lebanon, Pa.
Leffingwell Chemical Co., Whittier, Calif.
Lenox Fertilizer Corp., Lenox, Iowa
Leon's Horticulture Specialties Co., Glendale, Calif.
Liberty Manufacturing Co., Red Springs, N. C.
Charles H. Lilly Co., Seattle, Ellensburg & Mt. Vernon, Wash.
Lincoln Service & Supply, Inc., Grand Island, Nebr.
Lion Oil Co., El Dorado, Ark. & Luling, La.
Liquid Plant Food, Monrovia, Calif.
Liquinox Co., Orange, Calif.
Liston Warehouse, Durham, Calif.
Lodi Agriculture Suppliers, Inc., Lodi, Calif.
Logan-Robinson Fertilizer Co., Charleston, S. C.
Loncala Phosphate Co., High Springs, Fla.
Longaker Mills, Inc.—Div. Federal Chem. Co., Butler, Ind.
Long Island Produce and Fertilizer Co., Inc., Riverhead, Mattituck & Southold, N. Y.
J. W. Looper & Swann, Dalton, Ga.
Louisiana Agricultural Supply Co., Inc. Baton Rouge, La.
Louisville Fertilizer & Gin Co., Louisville, Ga.
Lovett & Co., Inc., Wrightsville, Ga.

Lovett & Brinson, Inc., Dublin, Ga.
 Lowell Rendering Co., North Billerica, Mass.
 Lynchburg Fertilizer Co., Lynchburg, S. C.
 Lynden Department Store, Inc., Lynden, Wash.
 Lyons Fertilizer Co., Tampa, Fla.

M

M-16 Products, Inc., Leesburg, Fla.
 J. A. McCarty Seed Co., Evansville, Ind.
 McConnell Fertilizer Co., Royston, Ga.
 McCook Fertilizer, Inc., Grand Island & McCook, Nebr.
 McDuffie Oil & Fertilizer Co., Thomson, Ga.
 P. R. McKnight & Son Gin Co., Senoia, Ga.
 McLaurin's, Inc., Rockingham, N. C.
 McLees Fertilizer Co., Anderson, S. C.
 McMillan & Harrison Fertilizer Co., Mobile, Ala.
 Mackenzie Chemical Co., Sacramento, Calif.
 Magee Cooperative (AAL), Magee, Miss.
 Magnolia Fertilizer Co., Vicksburg, Miss.
 Magnolia Fertilizer Co., Seattle, Wash.
 The Mamlon Co., New Haven, Conn.
 Manchester Products, Galt, Ont., Canada
 Manito Filler Co., Inc., Peoria & Manito, Ill.
 Manning & Shine, Latta, S. C.
 Cipriano Manrique, Inc., Caguas, P. R.
 Marico, Inc., Ocala, Fla.
 Marine By-Products Fertilizer Co., Seattle, Wash.
 Marine Feed & Fertilizer Co., Gulfport, Miss.
 Marion Cotton Oil Co., Marion, S. C.
 Marion Plant Life Fertilizer Co., Marion, Ohio
 Marques Commercial, Inc., Arecibo, P. R.
 Marquiss Farm Supply Co., Clinton, Ill.
 Marshall Cotton Oil Co., Marshall, Texas
 Mashburn & Fitzgerald, Rochelle, Ga.
 Mason Gin & Fertilizer Co., Madison, Ga.
 Master Chemical Corp., Fairmont, N. C.
 Maxton Oil & Fertilizer Co., Maxton, N. C.
 Maybank Fertilizer Corp., Charleston, S. C.
 Meeker-Hughes Co., Inc., Salem, Oreg.
 The Frederick Mehring Fertilizer Works, Inc., Keymar, Md.
 Meigs Farmers Cooperative, Decatur, Tenn.
 Meiners Soil Service, Inc., Colfax, Ill.
 Melson Fertilizer Co., Inc., Georgetown, Del.
 Merchants Fertilizer & Phosphate Co. of Pensacola, Inc., Pensacola, Fla.
 Meridian Fertilizer Factory, Hattiesburg, Miss.
 Miami Fertilizer Co., Dayton, Ohio
 Mid-South Chemical Co. (See Apco Fertilizer Co.)
 Mid-State Fertilizer Co., Redmond, Oreg.
 Mid-State Supply Co., Hanna City, Ill.
 Mid Way Soil Center, Inc., Decatur, Illinois
 Midwest Plant Food, Inc., Napoleon, Ohio
 Midwestern Phosphate Corp., Madison, Wisc.
 Milford Fertilizer Co., Milford, Del.
 The Millen Fertilizer Co., Millen, Ga.
 Miller Chemical Co. of N. J., Bridgeton, N. J.
 Miller Chemical Corp., Charlestown, W. Va.
 Miller Chemical & Fertilizer Corp., Baltimore, Gaithersburg & Whiteford, Md.; Hanover, Pa.
 Miller Fertilizer Co., Jefferson, S. C.
 Miller Products Co., Portland, Oreg.
 James Mills Growers Service Co., Hamilton City, Calif.
 Milwaukee Sewerage Commission, Milwaukee, Wisc.
 Min-A-Ray Products Co., El Monte, Calif.
 Minden Cotton Oil & Ice Co., Ltd., Minden, La.
 Mineral Fertilizer Co., Midvale, Utah
 Minnesota Farm Bureau Service Co., St. Paul, Minn.
 Minute Maid Groves Corp., Fertilizer Div., Frostproof & Dr. Phillips, Fla.
 Misner Fertilizers, Ltd., Port Dover, Ont., Canada
 Mississippi Chemical Corp., Yazoo City, Miss.
 Mississippi Federated Cooperatives, Jackson, Canton, Corinth, Laurel & Meridian, Miss.
 Mississippi River Chemical Co.—Div. Mississippi River Fuel Corp., St. Louis & Selma, Mo.
 Missouri Farmers Assn., Inc., Columbia, Albany, Butler, California, Centralis, Joplin, El Dorado Springs, Gallatin, Maryland Heights, Lockwood, Rolla, Slater, Springfield & Union, Mo.
 Missouri Plant Food Co., Inc., Sikeston, Mo.
 Modern-Ag Crop Service, Fresno, Calif.
 Moloney Seed Co., Monte Vista, Colo.
 Molony Fertilizer Co., Charleston, S. C.
 Monroe Oil & Fertilizer Co., Monroe, Ga.

Montreal Coke & Manufacturing Co., Montreal, Que., Canada
 The Moore Co., Savannah, Ga.
 The Mountain Copper Co., Ltd., San Francisco & Martinez, Calif.
 Muscle Shoals Chemical Co., Tuscumbia, Ala.
 Mutual Fertilizer Co., Savannah, Ga.

N

Na-Churs Plant Food Co., Marion, Ohio
 Na-Churs Plant Food Co. (Canada) Ltd., London, Ont., Canada
 National Fertilizer Co.—Div. National By-Products, Inc., Des Moines, Iowa; Fairbury & S. Sioux City, Nebr.
 Natural Plant Food Co., Inc., Oklahoma City, Okla.
 Nebraska Fertilizer Co., Omaha, Nebr.
 Neosho Fertilizer, Inc., Chanute, Kans.
 New Bern Oil & Fertilizer Co., New Bern, N. C.
 New Haven Rendering Co., West Haven, Conn.
 New Mexico Fertilizer Co., Albuquerque, N. M.
 Lloyd Newell, Inc., Lancaster, Calif.
 Newton Oil Mill, Newton, Miss.
 Newton Oil & Fertilizer Co., Newton, N. C.
 Nicho's Fertilizer Corp., Norfolk, Va.
 Nichols Fertilizer & Chemical Co., Oklahoma City, Okla.
 W. P. Nimmons & Co., Seneca, S. C.
 Nitrogen Div.—Allied Chemical & Dye Corp., New York, N. Y.; Omaha, Nebr.; Ironton, Ohio; Hopewell, Va.
 Nitrogen Products Corp., Palo Alto, Calif.
 The Norris Fertilizer Co., Rushville, Ind.
 V. W. Norris & Son, Inc., Rushville, Ind.
 Norsco Products, Inc., San Jose, Calif.
 North American Cyanamid Co., Ltd., Toronto, Niagara Falls & Port Robinson, Ont., Canada
 North American Fertilizer Co., Louisville, Ky.
 North American Phosphate Co., Louisville, Ky.
 North East Mississippi Fertilizer Co., Amory, Miss.
 North Idaho Chemical Co., Inc., Lewiston, Idaho
 Northern California Fertilizer Co., San Jose, Calif.
 Northern Chemical Industries, Baltimore, Md.; Searsport, Maine
 Northwest Cooperative Mills, St. Paul & Winona, Minn.; Green Bay, Wisc.
 Nulife Fertilizer, Inc., Tacoma, Wash.
 Nutra-Flo Fertilizer Div.—Central States Cordage Co., Sioux City, Iowa
 Nutri-Sol Chemical Co., Tampa, Fla.
 Nutt & Bond, Inc., Jackson, Ga.

O

Ochoa Fertilizer Corp., Hato Rey, Guanica & Ponce, P. R.
 Ocilla Oil & Fertilizer Co., Ocilla, Ga.
 Ogallala Chemical Specialties, Inc., Ogallala, Nebr.
 The Ohio Farmers Grain & Supply Assn., Fostoria, Ohio
 Ohio Valley Fertilizer Corp., Maysville, Ky.
 Kinchen O'Keefe & Co., Greenville, Miss.
 Old Deerfield Fertilizer Co., Inc., South Deerfield, Mass.
 Olds & Whipple, Inc., Hartford, Conn.
 Olin Mathieson Chemical Corp., Baltimore, Md.; Phoenix, Ariz.; Little Rock & N. Little Rock, Ark.; Williamston, N. C.; Lebanon, Pa.; Pasadena, Texas; Morgantown, W. Va.
 Omega Fertilizer Works, Omega, Ga.
 Ontario Fertilizer Works, Inc., Ontario, Calif.
 Ontario Plant Foods, Ltd., Delhi, Ont., Canada
 Orange Belt Supply Co., Lindsay, Calif.
 Orchard Supply Building Co., San Jose, Calif.
 Oregon-Washington Fertilizer Co., Seattle, Wash.; Portland, Oreg.
 Orfac Corp., French Camp & Stockton, Calif.
 The Organic Development Co., Fullerton, Md.
 Organic Plant Food Co., Lancaster, Pa.

P

Pacific Chemical & Fertilizer Co., Honolulu, Oahu; Hilo, Hawaii; Kahului, Maui; Puhu, Kauai, T. H.
 Pacific Coast Fertilizer Co., Thermopolis, Wyo.
 Pacific Coast Borax Co.—Div. Borax Consolidated, Ltd., Los Angeles, Boron & Wilmington, Calif.
 Pacific Guano Co., Berkeley, Holtville & Los Angeles, Calif.; Tolleson, Ariz.



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A complete line of **INDUSTRIAL TRUCKS**

1,000 TO 30,000 LBS. CAPACITY
LIFT TRUCKS • STRADDLE TRUCKS
KARRY CRANE • TURRET TRUCKS
Plus Over 100 Job Attachments

Pacific Supply Cooperative-Chemical Div., Portland, Madras & Ontario, Oreg.; Quincy, Wash.
 Pamplico Fertilizer Co., Inc., Pamplico, S. C.
 Parco, Inc., Los Angeles, Calif.
 Pasco Packing Co.—Fertilizer Div., Dade City, Fla.
 Pearl Phosphate Co., W. Covina, Calif.; Woodruff, Utah
 Pearsall & Co., Wilmington, N. C.
 Peavey Fertilizer Plant—Div. F. H. Peavey Co., Fargo, N. Dak.
 Peerless Fertilizer Co., Inc., Chestertown, Md.
 Pelham Phosphate Co., Pelham, Ga.
 Pendleton Oil Mill, Inc., Pendleton, S. C.
 Peninsular Fertilizer Works—Div. Wilson & Toomer, Inc., Tampa, Fla.
 People's Fertilizer Co., Foley, Ala.
 C. D. Perkinson Co., Decatur, Ill.
 Peterman Agricultural Co., Peterman, Ala.
 James S. Peters Fertilizer Co., Manchester, Ga.
 Robert B. Peters Co., Allentown, Pa.
 Phillips Chemical Co., Bartlesville, Okla.; Scottsbluff, Nebr.; Crane, Etter, Goldsmith & Pasadena, Texas.
 Phoenix Chemical Co., Phoenix, Ariz.
 Phosphate Minerals, Inc., Kemmerer, Wyo.
 Piedmont Fertilizer Co., Inc., Opelika, Ala.
 Piedmont Fertilizer Corp., Greenwood, S. C.
 Pierce Phosphorus, Pierce, Fla.
 J. L. Pilcher & Sons, Inc., Meigs, Ga.
 The Pine Level Oil Mill Co., Pine Level, N. C.
 Pinellas Growers Assn. Fertilizer Works, Clearwater, Fla.
 Pioneer Phosphate Co., Inc., Des Moines, Iowa
 Plant Food Corp., Los Angeles, Bakersfield & Pomona, Calif.
 Plant Products Corp., Blue Point, N. Y.
 Plantabbs Corp., Baltimore, Md.
 Planters Cotton Oil & Fertilizer Co., Rocky Mount, N. C.
 The Planters Exchange, Inc., Havana, Fla.
 Planters Fertilizer & Phosphate Co., Charleston, S. C.; Charlotte, N. C.
 Planters Fertilizer & Soybean Co., Pine Bluff, Ark.
 Planters Warehouse & Loan Co., Fitzgerald, Ga.
 Planters Warehouse Co., Newborn, Ga.
 Plantsmiths, Palo Alto, Calif.
 Plymouth Fertilizer Works, Plymouth, Fla.
 Polk County Fertilizer Co., Haines City, Fla.
 Henry A. Pollak & Co., Hicksville, L. I., N. Y.
 Carl Pool Laboratories, San Antonio, Texas
 Port Fertilizer & Chemical Co., Los Fresnos, Texas
 Portland Rendering Co., Portland, Maine
 Potash Co. of America, Carlsbad, N. M.
 Price Chemical Co., Louisville, Ky.
 Warner W. Price Co., Inc., Smyrna, Del.
 Chas. W. Priddy & Co., Norfolk, Va.
 A. F. Pringle & Co., Inc., Charleston, S. C.
 Producers Livestock Marketing Assn., Salt Lake City, Utah
 "Pronto" Liquid Fertilizer Corp., Eunice, La.
 Producers Supply, Inc., Palmetto, Fla.
 Productora de Superfosfatos, S. A. Habana, Cuba

R

Ramsburg Fertilizer Co., Frederick, Md.
 Ra-Pid-Gro Corp., Dansville, N. Y.
 The Rath Packing Co., Waterloo, Iowa
 E. Rauh & Sons Fertilizer Co., Indianapolis, Ind.; Silica, Ohio; Plymouth, Ind.
 Ravel Brothers, Inc., Albuquerque, N. M.
 Read Bros. Fertilizers, Ltd., Elmira, Ont., Canada
 Reading Bone Fertilizer Co., Reading, Pa.
 John Reardon & Sons, Cambridge, Mass.
 Red Star Fertilizer Co., Sulphur Springs, Texas
 Redwine Bros., Fayetteville & Tyrone, Ga.
 Reed & Perrine, Inc., Tennent, N. J.
 Remwood Chemical Co., Tulsa, Okla.
 Robert A. Reichard, Inc., Allentown, Pa.
 The Reliance Fertilizer Co., Savannah, Ga.
 Reliance Fertilizer & Lime Corp., S. Norfolk, Va.
 Reliance Guano Co., Inc., Whiteville, N. C.
 Richmond Guano Co., Richmond, Va.
 Ricks Fertilizer Co., Mount Olive, N. C.
 Ridge Fertilizer Co., Lake Wales, Fla.
 Ridge Fertilizer Co., Johnston, S. C.
 Riverside Fertilizer Factory, Marks, Miss.
 Riverside Fertilizer Works, Riverside, Calif.
 Roanoke Guano Co., Roanoke, Ala.

Robertson Chemical Corp., Norfolk & South Hill, Va.; Raleigh, Statesville & Wilmington, N. C.
 Robertson Fertilizer Co., Clayton, Ala.
 Robeson Manufacturing Co., Lumberton, N. C.
 Roche Manufacturing Co., Dublin, Ga.
 Rogers & Hubbard Co., Portland, Conn.
 Roigina Products, Lincoln, Nebr.
 Rose Manufacturing Co., Beacon, N. Y.
 Rose City Cotton Oil Mill Co., Little Rock, Ark.
 Ross Fertilizer Co., Clinton, N. C.
 Rowe Warehouse & Fertilizer Co., Athens, Ga.
 Rowland & Gordon Co., Plainview, Texas
 N. Roy & Son, Attleboro, Mass.
 F. S. Royster Guano Co., Norfolk, Va.; Bessemer & Montgomery, Ala.; Mulberry, Fla.; Athens, Atlanta & Macon, Ga.; Indianapolis, Ind.; Baltimore, Md.; Jackson, Miss.; Lyons, N. Y.; Charlotte & Navassa, N. C.; Toledo, Ohio; Charleston & Spartanburg, S. C.; Buell, Lynchburg & S. Norfolk, Va.; Madison, Wisc.
 Ruhm Phosphate & Chemical Co., Columbia, Tenn.
 Ruston Oil Mills & Fertilizer Co., Ruston, La.
 Russell Fertilizer Works, Williamson & Union Hill, N. Y.
 Rutledge Manufacturing Co., Rutledge, Ga.

S

Sacramento Valley Milling Co., Glenn, Calif.
 Sagadahoc Fertilizer Co., Inc., Bowdoinham, Maine
 Salley Gin & Fertilizer Co., Salley, S. C.
 Salmon By-Products Co., Inc., Ketchikan, Alaska
 Keys Sanders Fertilizer Co., Gaffney, S. C.
 San Francisco Chemical Co., Sage, Wyo.
 San Jacinto Chemical Co.—Div. Smith-Douglass Co., Inc., Houston, Texas
 San Miguel Fertilizer Corp., San Juan, P. R.
 Santee Guano Co., Greeleyville, S. C.
 Sapon Mills, Inc., Sanford, N. C.
 A. B. Schofield Soil Service, Paxton, Ill.
 Schrock Fertilizer Service—Div. Schrock Bros. Co., Congerville, Ill. & Bern, Kans.
 O. M. Scott & Sons Co., Marysville, Ohio
 Screven Oil Mill, Sylvania, Ga.
 Scioto Farm Chemicals, Inc., Chillicothe, Ohio
 Senesac Soil Service, Fowler, Ind.
 Shannon Agricultural Laboratories, Tulsa, Okla.
 Shea Chemical Corp., Jeffersonville, Ind.; Adams, Mass.; Columbia, Tenn.; Dallas, Texas
 Shell Chemical Corp., New York, N. Y.; San Francisco, Pittsburg & Ventura, Calif.
 Shepard Fertilizer Co., Moultrie & Doerun, Ga.
 Shields Co., Scotland Neck, N. C.
 M. L. Shoemaker Co., Philadelphia, Pa.
 Shore Fertilizer Co., Plant City, Fla.
 Shreveport Fertilizer Works, Shreveport, La.
 Shur-Crop Corp., Monroe, Wash.
 Shur-Gain, Inc., Presque Isle, Maine
 Simonsen Mill Rendering Plant, Quimby, Iowa
 J. R. Simplot Co., Fertilizer Div. Pocatello, Idaho
 Simplot Soil Builders—Div. J. R. Simplot Co., Pocatello, Caldwell, Idaho Falls, & Twin Falls, Idaho; Swink & Greeley, Colo.; Klamath Falls, Oreg.
 Singletary Fertilizer Co., Lake City, S. C.
 Slemmons Gardens, Worthington, Ohio
 J. F. Sloan Co., Salinas, Calif.
 L. B. Skinner Co., Inc., Dunedin, Fla.
 The Smith Agricultural Chemical Co., Columbus & Carey, Ohio; Indianapolis, Ind.; Holland & Saginaw, Mich.
 The C. D. Smith Co., Grand Junction, Colo.
 C. O. Smith Guano Co., Moultrie & Douglas, Ga.
 Smith & Brooks, Inc., Fountain Inn, S. C.
 Smith-Douglass Co., Inc., Norfolk, Va. Streator, Ill.; Albert Lea, Minn.; Kinston & Wilmington, N. C.; Danville, Va.
 Smith Equipment and Supply Co., Chicago, Ill.
 Smith Fertilizer Co., Statesboro, Ga.
 Smith Fertilizer Co., Williston, S. C.
 Smith-Rowland Co.—Div. Smith-Douglass Co., Inc., Norfolk, Va.; Selbyville, Del.; Granite City, Ill.
 Smoky Mountains Fertilizer Co., Waynesville, N. C.
 Snyder Chemical Co., Inc., Topeka & Hutchinson, Kans.
 Soil-Aid Corp., Coffeyville, Kans.
 Soil Builders, Inc., Dunnellon, Fla.
 Soil Prescription Service, Mercedes, Tex.
 Soil Service, Seaford, Del.
 Soil Service, Denton, Md.
 Soilife, Inc., Boise, Idaho

Soiltone Fertilizer Co., Lincoln, Nebr.
Soluble Plant Nutrients Co., Azusa, Calif.; Augusta, Kansas
Soperton Guano Co., Soperton, Ga.
South Jersey Farmers Exchange, Woodstown, N. J.
South Lake Fertilizer Works, Oakland, Fla.
Southern Agricultural Fertilizer Co., Clarksdale, Miss.
Southern California Fertilizer Co., Los Angeles, Calif.
The Southern Cotton Oil Co., New Orleans, La.; Birmingham, Cullman, Decatur, Montgomery, Ala.; Little Rock, Ark.; Pensacola, Fla.; Cartersville, Cordele, Dawson, Dublin, Ft. Gaines, McRae, Macon & Warrenton, Ga.; Davidson, Gibson, Goldsboro, Rocky Mount, Shelby & Wilson, N. C.; Columbia, Florence, Laurens & Spartanburg, S. C.
Southern Fertilizer & Chemical Co., Savannah, Ga.; Myers & Roebuck, S. C.
Southern Florida Fertilizer Co., Goulds, Fla.
Southern Guano Co., Winder, Ga.
Southern Oregon Sales, Inc., Medford, Oreg.
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Southwest Chemical Co., Chickasha, Okla.
Southwest Chemical Co., Inc., McAllen, Texas
Southwest Co-Operative Wholesale, Phoenix, Ariz.
Southwest Fertilizer & Chemical Co., El Paso & Pecos, Tex.; Anthony, N. M.
Southwest Fertilizer Co., Dallas, Texas
Southwest Potash Corp., New York, N. Y.; Carlsbad, N. M.
Southwest Virginia Cooperative, Inc., Bristol, Va.
Spencer Chemical Co., Kansas City, Mo.; Pittsburg, Kans.; Henderson, Ky.; Vicksburg, Miss.
Spencer Plant Foods, Inc., Spencer, Iowa
Springfield Rendering Co., Chicopee, Mass.
The Stadler Fertilizer Co., Cleveland, Ohio
Standard Chemical Co., Troy, Ala.
Standard Fertilizer Co., Meigs, Ga.
Stanton Co., Holland, Mich.
Staple Cotton Cooperative Assn., Greenwood, Miss.
Star Fish & Bone Fertilizer Co., Bridgeton, N. J.
Stauffer Chemical Co., New York, N. Y.; San Francisco, Richmond & Vernon, Calif.; Tacoma, Wash.
The Steel Co. of Canada, Ltd., Hamilton, Ont. Canada
Stevens Industries, Inc., Dawson, Ga.
Stim-U-Plant Laboratories Co., Columbus, Ohio
E. B. Stone & Son, Salinas, Calif.
William Stone Sons, Ltd., Ingersoll, Ont. Canada
R. F. Strickland Co., Concord, Ga.
The Summers Fertilizer Co., Inc., Baltimore, Md.; Houlton, Mars Hill & Sandy Point, Maine; Grand Forks, N. D.; McKeesport, Pa.; Sioux Falls, S. D.; Saint Stephens, N. B., Canada
Sumter Fertilizer Manufacturing Co., Inc.—Subsidiary of Planters Fert. & Phosphate Co., Sumter, S. C.
Sun Phosphate Co., Dunnellon, Fla.
Sunbeam Services & Supplies, Washington, Ga.
Sunland Industries, Inc., Fresno, Calif.
Sunshine Plant Food Co., Inc., Clovis, N. M.
Superior Fertilizer & Chemical Co., Tampa & Ft. Pierce, Fla.
Superior Phosphate Co., Dunnellon, Fla.
Super-A Fertilizer Works, Inc., Mayaguez, P. R.
Super-Crop Plant Foods, Inc., Ottumwa, Iowa
Supreme Feed & Fertilizer Co., Philadelphia, Miss.
Sur-Gro Plant Food Co., Plattsburg, Mo.
Sure-Crop Chemical Co., Bayard, Nebr.
Swack Fertilizer Co., Du Bois, Pa.
Swift & Co.—Plant Food Div., Chicago, Ill.; Hayward, Los Angeles, Calif.; Bartow & Winter Haven, Fla.; Albany, Atlanta, LaGrange & Savannah, Ga.; Calumet City & National Stock Yards, Ill.; Mason City, Iowa; Harvey & Shreveport, La.; Baltimore, Md.; Greensboro & Wilmington, N. C.; Cleveland & Greenville, Ohio; North Portland, Oreg.; Columbia, S. C.; Houston, Tex.; Norfolk, Va.; Madison, Wisc.; New Toronto, Ont., Canada.
Sylacauga Fertilizer Co., Sylacauga, Ala.
Syracuse Rendering Co., Syracuse, N. Y.

T

T & K Fertilizer Co., Union City, Tenn.
Tank Fertilizer, Inc., Brawley, Calif.
John Taylor Fertilizer Co., Sacramento, Calif.
T. F. Taylor Fertilizer Works, Inc., Moultrie, Ga.
"10-E. M." Plant Food, Miami, Fla.
Tennessee Corp., New York, N. Y.; Attalla & Tuscaloosa,

Ala.; Cedartown, East Point & Gainesville, Ga.; New Albany, Ind.; Cincinnati, Ohio
Tennessee Farmers Cooperative, LaVergne & Tenco, Tenn.
Tennessee Plant Food Co. Div.—Soil Builders, Inc., Clarks-ville, Tenn.
Tennessee Valley Cooperatives, Decatur, Ala.
Terra Food Fertilizer Co., El Monte, Calif.
The Terre Co., Rochelle Park & Totowa, N. J.
Texas Farm Products Co., Nacogdoches, Texas
Texas Liquid Fertilizer Co., Inc., La Feria, Tex.
Tiger Chemical Co., Onawa, Iowa
I. P. Thomas Div., Pennsylvania Salt Mfg. Co., Philadelphia, Pa. & Paulsboro, N. J.
Thomasville Fertilizer Co., Thomasville, Ga.
W. B. Tilghman Co., Inc., Salisbury & Pocomoke City, Md.
Toledo Div. Sewage Disposal, Toledo, Ohio
Toney Bros., Doreun, Ga.
Trenton Bone Fertilizer Co., Trenton, N. J.
Triangle Co. of Central California, Salinas, Calif.
Tri-State Chemical Co., Henderson, Ky.
Tri-State Chemical Co., Webb City, Mo.; Springdale, Ark.
Tri-State Fertilizer Co., Canton, Mo.
Tri-State Milling Co., Rapid City, S. D.
Trueman Fertilizer Co., Jacksonville, Fla.
Truitt's Hydroponic Gardens, Ft. Scott, Kans.
F. W. Tunnell & Co., Inc., Philadelphia, Pa.
Steve Turner Farm Seeds, Pontiac, Ill.
Tuskegee Oil & Fertilizer Co., Tuskegee, Ala.
Tusko Fertilizer Co., Walla Walla, Wash.
Tyler Fertilizer Co., Tyler, Texas
Tyler Grain & Fertilizer Co., Wooster & Weilersville, Ohio
J. A. Tyler and Sons, Wagener, S. C.

U

Union Fertilizer Co., Richmond, Calif.
Union Fertilizer Corp., Hanover, Pa.
Union Oil Mills, Union, S. C.
United By-Products Co., Hackettstown, N. J.
United Cooperatives of Ontario, W. Toronto & Thames-ville, Ont., Canada
United Fertilizer Co., Richmond, Calif.
United Fertilizer Co., Carrollville, Wisc.
U. S. Industrial Chemicals Co.—Div. National Distillers Products Corp., New York, N. Y.; Tuscola, Ill.
U. S. Phosphoric Products—Div. Tennessee Corp., Tampa, Fla.
United Sulphur Co., Los Angeles, Calif.
U. S. Potash Co., New York, N. Y.; Carlsbad, N. M.
United States Steel Corp., Pittsburgh, Pa.
Utah By-Products Co., Salt Lake City, Utah
Utah Idaho Sugar Co., Salt Lake City, Utah & Idaho Falls, Idaho

V

E. S. Valliant & Son, Inc., Centreville, Md.
Valliant Fertilizer Co., Laurel, Del.
Valley Feed & Supply Co., Inc., Spring Valley, N. Y.
Valley Fertilizer Co., Greenville, Miss.
Valley Fertilizer & Chemical Co., Inc., Mt. Jackson, Va.
Valley Fertilizer Co., Aliceville, Ala.
Valley Fertilizer Co., Alamosa, Colo.
Valley Wholesale & Warehouse Co., Ontario, Oreg.
H. H. Van Gorden & Sons, Neilsville, Wisc.
The Vance Co., Inc., Chilhowie, Va.
Van Camp Seafood Co., Terminal Island, Calif.
Victor Chemical Works, Chicago & Chicago Heights, Ill.
Victor Fertilizer Co., Chester, S. C.
Vidalia Chemical Co., Vidalia, Ga.
Vidette Fertilizer Co., Louisville & Vidette, Ga.
Virginia-Carolina Chemical Corp., Richmond, Va.; Bir-mingham, Dothan, Mobile, Montgomery & Wylam, Ala.; N. Little Rock, Ark.; Jacksonville & Nichols, Fla.; Al-bany, Atlanta, Augusta, Rome & Savannah, Ga.; E. St. Louis, Ill.; Ft. Wayne, Ind.; Dubuque, Iowa; Hopkins-ville, Ky.; Shreveport, La.; Baltimore, Md.; Jackson, Miss.; Carteret, N. J.; Charlotte, Durham, Selma, Wades-boro & Wilmington, N. C.; Cincinnati, Ohio; Charleston & Greenville, S. C.; Memphis & Mt. Pleasant, Tenn.; Lynchburg & Portsmouth, Va.
Vitalerth Products, Ltd., Vancouver, B. C., Canada
Vorhes Chemical Corp., Charles City, Iowa

W

John Wachtel Corp., Indianapolis, Ind.
 Wadesboro Fertilizer Co., Wadesboro, N. C.
 Wagner Farm Products, Inc., Schuyler, Nebr.
 Waldo Fertilizer Works, Waldo, Ark.
 Walker Fertilizer Co., Orlando, Fla.
 Wallace Guano Co., Smithfield, N. C.
 I. G. Wallace & Son, Matthews, N. C.
 Walla Walla Meat & Cold Storage Co., Walla Walla, Wash.
 Oscar F. Warner Landscape Forester, Waterbury, Conn.
 Warren Cotton & Fertilizer Co., Inc., Warrenton, N. C.
 Warren Cotton Oil & Manufacturing Co., Warren, Ark.
 Warrior Fertilizer Co., Northport, Ala.
 Wasatch Chemical Co., Salt Lake City, Utah
 Washington Cooperative Farmers Assn. Inc., Seattle, Wash.
 Washington Liquid Fertilizer Co., Wapato, Wash.
 Washington Organic Fertilizer, Inc., Yakima, Wash.
 Waverly Fertilizer Works, Waverly, Fla.
 Waynesboro Fertilizer Co., Waynesboro, Ga.
 Weaver Fertilizer Co., Norfolk, Va.; Winston-Salem, N. C.
 The Weaver Tankage Corp., Norfolk, Va.
 Webfoot Fertilizer Co., Inc., Portland, Oreg.
 Wedgeworth's, Inc., Belle Glade, Fla.
 Weil's Fertilizer Works, Inc., Goldsboro, N. C.
 Welcome Agricultural Chemical Co., Welcome, Minn.
 Wells & Wade, Inc., Wenatchee, Wash.
 West Coast Fertilizer Co., Tampa, Fla.
 West Tennessee Tankage Co., Union City, Tenn.
 Western Carolina Phosphate Co., Waynesville, N. C.
 Western Farm Chemical Co., Woodland, Calif.
 Western Fertilizer Co., Inc., Muleshoe, Texas
 Western Fertilizers, Harlowton, Mont.
 Western Phosphates, Inc., Garfield, Utah
 Westminster Fertilizer Co., Westminster, Md.
 Westminster Gin & Fertilizer Co., Westminster, S. C.
 Wheeler Fertilizer Co., Oviedo, Fla.
 Whitehead & Gholston, Comer, Ga.
 Wichita Fertilizers, Inc., Wichita, Kansas
 Whitley Chemical Corp., Milan, Ill.

Wilbur-Ellis Co., Los Angeles, Chula Vista & Fresno, Calif.; Portland, Oreg.; Seattle, Wash.
 Wilde Farm Supply Co., Inc., Vineland, N. J.
 Williston Fertilizer Works, Williston, S. C.
 Wilmington Fertilizer Co., Wilmington, N. C.
 Andrew Wilson, Inc., Springfield, N. J.
 Wilson & Co., Chicago, Ill.
 Wilson & Toomer Fertilizer Co., Jacksonville, Cottondale, Fla.
 Wisconsin Farmco Service Cooperative, Madison, Antigo, Cameron, Green Bay, Prairie du Chein, S. Wayne & Whitewater, Wisc.
 Wisconsin Plant Food, Inc., Watertown, Wisc.
 Witts Fertilizer Works, Ltd., Norwich, Ont., Canada
 Wood Chemical Co., Lubbock, Texas
 Woodburn Feed & Supply Co., Woodburn, Oreg.
 Woodruff Fertilizer Works, Inc., North Haven, Conn.
 The Woodville Lime Products Co., Toledo & Woodville, Ohio
 Woodward Iron Co., Woodward, Ala.
 A. S. Wooley Co., Inc., Seaford, Del.
 Worcester Fertilizer Co., Snow Hill, Md.
 Chas. P. Wray & Co., Ridgeway, S. C.
 Wynns Fertilizer Co., Imperial, Calif.
 Wyocena Farmers Co-Operative Co., Wyocena, Wisc.
 Wyoming Minerals, Inc., Thermopolis, Wyo.

Y

Yakima Valley Spray Co., Yakima, Wash.
 Yamada Co., Gardena, Calif.
 Lewis Yoder Co., Nampa, Idaho
 York Stone & Supply Co., York, Pa.
 Yuba City Mills, Yuba City, Calif.

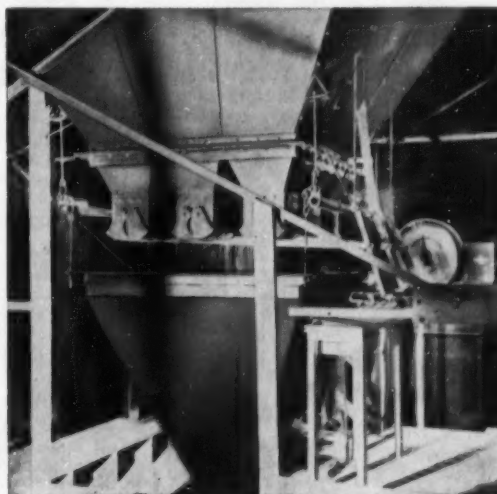
Z

Zaldo y Martinez, S. A., Havana, Cuba
 Zebulon Ginning & Fertilizer Co., Zebulon, Ga.

FERTILIZER MACHINERY

- MIXERS
- AMMONIATORS
- HOPPER SYSTEMS
- AUTOMATIC SOLUTION TANKS
- VIBRATING SCREENS
- PULVERIZERS
- CLOD BREAKERS
- ELEVATORS
- CONVEYORS
- GRANULATING PLANTS
- SUPERPHOSPHATE PLANTS
- TRIPLE SUPERPHOSPHATE PLANTS

D-K Fertilizer Machinery has been designed to save you, the operator, time, money and manpower in the manufacture of fertilizer. Each machine is designed to perform a specific operation efficiently and economically and is readily adaptable to any size plant.



Designers, Engineers and Manufacturers
 of Complete Fertilizer Plants and Equipment

DAVIDSON-KENNEDY CO.

ATLANTA,



GEORGIA

Geographical Directory of Fertilizer Manufacturers

If any plants have been omitted, either inadvertently or through lack of information from the manufacturer, the publishers will be glad to receive additions for publication in the next issue of Commercial Fertilizer YEAR BOOK.

Plant listings on the following pages have been classified with letter-keys preceding the name of each firm. Key explanations are listed below, and in the upper margin of succeeding pages.

Where available, both the production capacity and the product storage capacity (each furnished by the manufacturer) are indicated. Single tonnage figures are production capacity unless otherwise specified.

Number in parentheses following mailing address is Post Office zone number.

A—Mfg. sulphuric or phosphoric acid, superphosphate and mixed fertilizers

B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers

a—ammoniate

g—granulate

D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers

F—Offer dry spreader service

G—Sell liquid fertilizers made elsewhere

H—Offer liquid applicator service

L—Mix complete liquid fertilizers

O—Process organic materials

P—Sell pesticides

b—buy from outside source

f—formulate

m—mix with fertilizers

S—Mfg. specialty or shelf goods (lawn and garden)

*—Current information not received in time for publication

—No key indicates main or divisional office, no plant at this location

ALABAMA

ALICEVILLE

CaFPm—Valley Fertilizer Co.
Mobile Rd.; P. O. Box 488; tel: 4766.
J. B. Cunningham, Pres. & Pur.
Agt.; James L. Parker, V.P.; John
E. Lee, Treas.; John S. Park, Sec.;
Joe F. Stewart, Plant Mgr. 15,000
tons cap.; 5,000 tons stor.; 1 mill;
belt conveyors; 3 tractors.

ANDALUSIA

CaFPm—Covington Fertilizer Co.
300 E. Watson; tel: 1082. C. F.
Booth, Pres. & Plant Mgr.; Lamar
Cantelou, V.P.; J. D. Law, Jr., Sec.-
Treas. 8,000 tons cap.; 3,800 tons
stor.; 1 Atlanta Utility mill, 25 t/hr.
Continental belt conveyors; Hough
Payloader.

ATTALLA

C—Tennessee Corp.
(Main ofc.: New York, N. Y.) J. K.
Plummer, Gen. Mgr.

BESSEMER

B—F. S. Royster Guano Co.
32nd St. at 1st Ave.; P. O. Box 550.
(Main ofc.: Norfolk, Va.) J. G.
Bruce, Jr., Supt. 40,000 tons.

BIRMINGHAM

C—Armour Fertilizer Works
3945 E. Lake Blvd. (7); P. O. Box
1031 (1); tel: 52-1724 (Main ofc.: At-
lanta, Ga.) A. G. Henry, Div. Mgr.
C—The Southern Cotton Oil Co.
4201 Georgia Rd.; P. O. Box 2351;

tel: 92105, L. D. 92106. (Main ofc.:
New Orleans, La.) S. F. Hosey, Mgr.
A—Virginia-Carolina Chemical Corp.
Sales ofc: tel: 9-2181 & LD 9993;
factory tel: 9-8452. (Main ofc.: Rich-
mond, Va.)

CLANTON

CFPm—Clanton Fertilizer Co., Inc.
P.O. Box 468; tel: 729. C. W. Bal-
lard, Pres. & Pur. Agt.; E. Nix Lane,
V.P.; H. D. Ballard, Sec.-Treas. &
Mgr. Pest. Div.; L. M. Stewart,
Supt. 15,000 tons cap.; 20,000 tons
stor.; 4 hopper systems; 6 convey-
ors; 4 Payloaders; 2 spreader trucks;
2 trailer trucks; 2 1½-ton trucks.

CLAYTON

C—Robertson Fertilizer Co.
A. B. Robertson, Jr., atty. for Ex-
ecutors. Plant operated on limited
basis since death of owner Nov. 30,
1954; n.w in dormant state, pend-
ing sale.

COLUMBIA

Ca—Bell Fertilizer Co.
Tel: 2851. Claude H. Bell, Pres. &
Gen. Mgr.; Miss Martha Jane Bell,
V.P.; Mrs. Ruby M. Bell, Sec.-
Treas.; Floyd Calhoun, Supt. 10,000
tons cap.; 7,500 tons stor. No. 1½-
ton mill, 30t./hr. Overhead belt
conveyors; non-automatic hopper;
Payloaders.

CULLMAN

C—International Minerals & Chemi-
cal Corp.
204 1st St., W.; P. O. Box 297; tel:
103. (Main ofc.: Chicago, Ill.) C. L.
Stewart, Plant Mgr.

The Southern Cotton Oil Co.

P. O. Box 382; tel: 960. (Main ofc.:
New Orleans, La.) Dist. ofc. for
plants at: Birmingham, Decatur,
Montgomery, Ala.; Pensacola, Fla.

DADEVILLE

CaFPbm—Dadeville Fertilizer & Gin
Co.
J. B. Cox & Barnes M. Cox, Ptnrs.
10,000 tons cap.; 5,000 tons stor.
Hoppers; conveyors; tractor
shovels; mixer; elevators; bagging
equipment.

DECATUR

Ca—Decatur Fertilizer Co.
P. O. Box 325; tel: 1076. A. A. Jones,
Sr., Pres.; J. H. Jones, V.P.; A. A.
Jones, Jr., Sec.-Treas.; Earnest L.
McAbee, Supt. 15,000 tons cap.; 4,-
000 tons stor.; 1 mill, 1 ton; Hopper
system; 1-ton rotary mixer; Pay-
loaders.

C—The Southern Cotton Oil Co.

P. O. Box 98; tel: 10, L.D. 9900.
(Main ofc.: New Orleans, La.; Dist
ofc.: Cullman, Ala.) T. M. Harvey,
Mgr.

Ba—Tennessee Valley Cooperatives
P. O. Box 291; tel: L.D. 9908. G. L.
Brady, Pres.; E. P. Garrett, Gen.
Mgr.; R. C. Bibb, Supt. 30,000 tons
cap.; 18,000 tons stor.; 1 mixing
mill & 2 sacking mills, 30t./hr.; belt
conveyors and hopper system for
batching; tractor shovels.

DOTHAN

CaPm—Dothan Guano Co.
P. O. Box 1158; tel: 0-29720, F-
37500. A. A. Morris, Sr., Gen. Mgr.,

Prod. Mgr. & Pur. Agt.; A. A. Morris, Jr., Asst. Mgr.; L. J. Thomas, Asst. Mgr.; H. D. Meeks, Supt. 20,000 tons cap.; 15,000 tons stor.; 5 mills, 150 tons; belt conveyors; hopper system and double sacking on 2 machines; 6 tractor shovels.

Aa—The Home Guano Co.

Porter-Farmer Blvd.; P. O. Box 577; tel: 20900. M. L. Hanahan, Jr., Treas. & Gen. Mgr.; B. M. Hanahan, Sec.; R. C. Geiger, Supt. 40,000 tons.

A—Virginia-Carolina Chemical Corp.
Tel: 2-2445. (Main ofc: Richmond, Va.)

EUFAULA

CaF—Eufaula Cotton Oil Co.

Orange & Barbour St.; P. O. Box 417; tel: 28. M. H. Conner, Pres.; H. H. Conner, Jr., Mgr.; H. C. Conner, Sec.-Treas.; William Fulford, Supt. 10,000 tons cap.; 2,000 tons stor. 1 mill; 2 belt conveyors; home-made hopper system; 2 tractor shovels; bulk loading facilities.

FAYETTE

CP—Fayette Mill, Gin & Ice Co., Inc.

Mrs. A. M. Grimsley, Pres.; A. M. Grimsley, Jr., V.P.; J. J. Taylor, Sec.-Treas. & Mgr.; Malden Taylor, Supt. 4,000 tons cap.; 2,500 t. stor. 1 mill, 1t.

FLORENCE

Ba—International Minerals & Chemical Corp.

P. O. Box 158; tel: 2501. (Main ofc: Chicago, Ill.) B. V. Bender, Dist. Sales Mgr.; Edward N. James, Supt.

FOLEY

Ca—People's Fertilizer Co.

Tel: 70. W. R. Stuart, Pres.; Chan Smith, Mgr.; Louis Baker, Ofc. Mgr. 15,000 t. cap.; 8,000 t. stor. 1 mill; hopper systems; tractor shovels.

GREENVILLE

CFPbm—Greenville Plant Food Co.

Long St.; P. O. Box 352; tel: 646. R. B. Anderson (Andalusia, Ala.), Pres.; E. H. Anderson & J. A. Anderson (Hartford, Ala.), V. P.; Julian Maddox (Luverne, Ala.), Sec.-Treas. & Pur. Agt.; K. B. Maddox, Gen. Mgr. & Prod. Mgr.; Ernest H. Perry, Supt. 15,000 t. cap.; 7,000 t. stor. 1 mill, 35t./hr.; hopper system.

HEADLAND

Ca—Espy Fertilizer Co., Inc.

Tel: 3832. M. W. Espy, Pres. & Pur. Agt.; F. E. Sidney, V.P.; A. S. Hodges, Sec.-Treas.; E. M. Royals, Prod. Mgr. & Foreman; C. Cunningham, Supt. 10,000 t. cap.; 6,500 t. stor. 1 mill, 300t./day; belt conveyors; tractor shovels.

CF—Home Fertilizer & Cotton Oil Co., Inc.

E. R. Solomon, Pres. Mgr. & Pur. Agt.; Elsie B. Solomon, V.P. & Treas.; R. S. Shelley, Jr., Asst. Mgr.; T. L. Killingsworth, Plant Mgr. 10,000 tons.

HURTSBORO

C—Hurtsboro Fertilizer Co.

Tel: 2211 & (night) 4451. S. B. Williams, Owner & Mgr. 2,000 t. cap.; 2,500 t. stor. 1 mill.

KENTONA

E—Ketona Chemical Corp.

P. O. Box 6384, Tarrant, Ala.; tel: 52-2786. P. H. Neal, Pres.; J. B. Johnson, V.P.; G. B. Baylis, Sec.; J. E. Johnson, Treas.; D. G. Sentman, Asst. Sec.-Treas.; Dana F. Sprague, Wks. Mgr. 45,000 tons nitrogen solutions; 43,800 tons anhydrous ammonia. (Plant under construction at time of publication.)

MOBILE

CaPm—McMillan & Harrison Fertilizer Co.

957 McGowin Ave.; P. O. Box 261; tel: HE 2-6188. Horace L. Long, Owner; F. D. Moorer, Mgr.; John E. Dorland, Asst. Mgr.; Charles E. Sexton, Supt. 12,000 t. cap.; 4,000 t. stor. 1-t. batch mixer; hopper systems; conveyors; tractor shovels.

A—Virginia-Carolina Chemical Corp.
Tel: 56-6561. (Main ofc: Richmond, Va.)

MONTGOMERY

Ca—Alabama Fertilizer Co.

Old Hayneville Rd.; P. O. Box 588; tel: 2-2887. John R. Hudson, Pres.; Mark J. Bridges, Mgr. 15,000 t. cap.; 5,000 t. stor. 1 mill; 30t./hr.; Bin batch; conveyors; Payloaders; automatic bagging machine.

A—The American Agricultural Chemical Co.

P. O. Box 911 (2); tel: (sales) 2-0361, (works) 2-3498. (Main ofc: New York, N. Y.) W. B. Walker, Mgr.; T. D. Conner, Supt.

C—Armour Fertilizer Works

1584 Parallel St.; P. O. Box 468 (1); tel: 3-3839, 3-3830. (Main ofc: Atlanta, Ga.) R. A. Ellington, Div. Mgr.

BPbm—Capital Fertilizer Co.

N. Montgomery; P. O. Box 591. E. T. Spidle, Gen. Mgr.; Henry H. Houlton, Supt. 50,000 t. cap.; 30,000 t. stor. 3 mills, 300t./day each. Complete hopper system; conveyors; drag shovels.

Ba—International Minerals & Chemical Corp.

Parallel St. (Scotts Bend); P. O. Box 829; tel: 3-2505, 3-2506. (Main ofc: Chicago, Ill.) S. P. Marshall, Jr., Area Mgr.; O. Evans Vaughan, Dist. Sales Mgr.; J. B. Demby, Supt.

B—F. S. Royster Guano Co.

9th & Court Sts.; P. O. Box 870. (Main ofc: Norfolk, Va.) D. L. Thames, Supt.

C—The Southern Cotton Oil Co.

P. O. Box 115; tel: 23811, L.D. 59; (Main ofc: New Orleans, La.; Dist. ofc: Cullman, Ala.) G. Tatum, Jr., Mgr.

B—Virginia-Carolina Chemical Corp.

Tel: 2-2741, 2-2742 & LD 25; factory tel: 2-3326. (Main ofc: Richmond, Va.)

NORTHPORT

C—Warrior Fertilizer Co.

3008 12th St.; tel: 8-5860. H. H. Maxwell, Mgr.; Mrs. Ruby B. Maxwell, Ptnr. 8,000 t. cap.; 2,000 t. stor. 1 mill.

OPELIKA

CFPb—Alabama Oil & Guano Co.

Tel: 7. C. M. Jernigan, Pres.; Jno.

J. Banks, V.P.; Chas. H. Jernigan, Treas.; John T. Dorsey, Sec.; Wm. H. Knight, Plant Mgr. 10,000 tons. 1 mill, 30 tons per hr.; 4 continental belt conveyors.

C—Piedmont Fertilizer Co., Inc.

Tel: 1567. E. F. Jackson, Pres. & Gen. Mgr.; H. C. Jackson, Sec.-Treas. 10,000 tons. 1 mill; belt conveyors & hopper systems.

PETERMAN

CaFPbm—Peterman Agricultural Co.

Tel: 365-J. P. S. Jackson, Pres.; J. F. Nettles, V.P. & Plant Mgr.; A. A. Nettles, V.P. 12,000 t. cap.; 5,000 t. stor. 1 mill. 30t./hr.; Hopper system; belt conveyors; Payloaders.

PHENIX CITY

ADFPb—Chavala Cooperative, Inc.

P. O. Box 125. E. G. Adamson, Plant Mgr. 10,000 tons.

ROANOKE

Ba—Roanoke Guano Co.

P. O. Box 312; tel: 6241. J. H. Owens, Pres.; W. A. Mitchum, Treas.; L. E. Cooper, Sls. Mgr.; W. Y. Ponder, Supt. 20,000 t. cap.; 12-15,000 t. stor. 2 mills, 20t./hr. each; conveyors; tractor shovels.

SELMA

BaBp—Central Farmers Co-Op., Inc.

E. Jeff Davis St.; P. O. Box 15; tel: TRinity 4-9083. S. J. Hardy, Pres.; J. H. Traylor, V.P.; J. H. Hain, Sec.-Treas.; E. B. Johnston, Gen. Mgr. & Mgr. Pesticide Div.; H. A. Paine, Supt. 20,000 t. cap.; 15,000 t. stor. 4 mills, 30 t. each; 4 large belt conveyors; 7 small belt conveyors; hopper systems; Payloaders; anhydrous ammonia storage facilities (30,000 gal.).

SYLACAUGA

CFPb—Sylacauga Fertilizer Co.

H. A. Parker, Pres., Treas. & Pur. Agt.; O. D. Parker, V.P.; Harry Appleby, Sec.; A. D. Kilgore, Supt.; Bill Nichols, Mgr. Pesticide Div. 20,000 tons.

TROY

Ba—Alabama Warehouse Co., Inc.

315 N. 3 Notch; P. O. Box 527; tel: 489. E. C. Bassett, Pres.; E. F. Dunbar, V.P.; G. M. Panhorst, Sec.-Treas.; H. M. Rose, Supt. 15,000 t. cap.; 10,000 t. stor. 2 mills, 25 t./hr. each; Hough loaders; conveyor belts; automatic scales; sewing machines.

A—Standard Chemical Co.

Tel: 52. Fred C. Broadway, Sec.-Treas. & Gen. Mgr.; E. C. Orme, Pres.; Louis T. Head, V.P.; Frederick Henderson, V.P.; E. C. Thompson, Supt. 75,000 tons. Practically all mechanized.

TUSCALOOSA

C—Tennessee Corp.

(Main ofc: New York, N. Y.) E. T. Spidel, Gen. Mgr. (Ala. Div.) 25,000 tons.

TUSCUMBIA

CPI—Consumers Bagging Co., Inc.

P. O. Box 190. N. B. Ware, Pres.; N. B. Ware, Jr., V.P. & Plant Mgr. Pesticide Div.; G. W. Schmidt, Treas.; W. A. Ware, Sec. 1,500 tons.

C—Muscle Shoals Chemical Co.

Tel: 664. N. B. Ware, Ptnr.; N. B. Ware, Jr., Ptnr., Plant Mgr. & Pur.

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
a—ammoniate g—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

Agt.; Claud Saint, Prod. Mgr. 10,000 tons. 1 mill; completely conveyorized; hog & belt feeder for elevator; Inglett & Corley automatic bagging unit; conveyor from bagger to loading dock.

TUSKEGEE

CaGFPbm—Tuskegee Oil & Fertilizer Co.
J. O. Youngblood, Sr., Pres.; J. L. Youngblood, Jr., Sec.; A. A. Beasley, Supt.; P. T. Godfrey, Bkpr. 10,000 t. cap.; 3,000 t. stor. 2 Payloaders; Atlanta Utility Conveyor and mixer.

WETUMPA

CaPb—Cantelou-Law Gin & Warehouse Co.
212 Montgomery St.; tel: 3441. J. D. Law, Jr., Pres. & Pur. Agt.; Lamar Cantelou, Sec.-Treas.; L. C. Thornton, Supt. 4,000 t. cap.; 1,500 t. stor.; 1 mill; continuous ammoniation; twin augur conveyors; 2 Payloaders.

WOODWARD

E—Woodward Iron Co.
Tel: (Bessemer) 5-2491. F. W. Sheppard, V.P., Sales; H. Clay Davis, Mgr. Coal Chem. Sales. Sulphate of ammonia.

WYLAM

E—Virginia-Carolina Chemical Corp.
(Sulphuric Acid Plant Only) Tel: 6-2040. (Main ofc: Richmond, Va.)

ARIZONA

GLENDAL

CGPfi—Arizona Plant Food Corp.
P. O. Box 217. Harvey Bales, Mgr. 20,000 tons.

PHOENIX

CLPfi—Arizona Fertilizers, Inc.
734 East Southern Pacific Dr. P. O. Box 2191; tel: ALpine 4-5678. Frank M. Feffer, Sr., Pres.; Frank M. Feffer, Jr., V.P.; M. F. Wharton, Sr., Sec.-Treas.; M. F. Wharton, Jr., Asst. Sec.-Treas.; Frank R. Marek, Plant Supt. 50,000 t. cap.; 6,000 t. stor. 1 mill, 6 t. (22 t./hr.); hopper, belt and screw conveyor; 4 fork-lift trucks; 3 Payloaders. Plants also at Toltec and Yuma, Ariz.

CFPfi—Capital Feed & Seed Co.
312 S. 15th Ave.; P. O. Box 6095; tel: ALpine 3-1171, L.D. 3. Herbert Stein, Pres.; Morton Kleinberg, V.P.; Jas. F. Wolf, Sec.-Treas.; Wm. Keeble, Plant Mgr.; H. C. Greer, Mgr. Pesticide Div. 3,000 t. cap.; 1,000 t. stor. 1 mill, 10 t./hr.; hopper systems.

CFGPfi—Olin Mathieson Chemical Corp.—Western Fertilizer Div.
(Main ofc: Little Rock, Ark.) P. O. Box 2010; tel: BRidge 5-5496. L. S. Madsen, Gen. Mgr.; Western Div.; M. L. Miller, Plant Mgr.

***—Phoenix Chemical Co.**
Paul E. Cook, Pres.; P. E. Cook, Sr., V.P., Sec.-Treas. 15,000 tons.

CDGPbf—Southwest Co-Operative Wholesale
1821 E. Jackson St. Orval Knox, Sec.; Joe Huron, Supt. 12,000 to 15,000 tons.

TOLLESON

CL—Pacific Guano Co.
(Main ofc: Berkeley, Calif.)

TOLTEC

C—Arizona Fertilizers, Inc.
P. O. Box 1034, Casa Grande. (Main ofc: Phoenix, Ariz.)

YUMA

L—Agriform Co., Inc.
(Main ofc: Santa Ana, Calif.) Wm. C. Rockwell, V.P. & Mgr. 20,000 tons cap.; 50,000 gal. stor.

C—Arizona Fertilizers, Inc.
Walnut St. at RR; P. O. Box 1309. (Main ofc: Phoenix, Ariz.) Charles Lairmore, Plant Mgr. 12,000 tons. 1 mill, 6 tons (10 t./hr.); belt conveyors & hopper systems.

DGHLPi—Atmar Distributing Co., Inc.
County Rd. 3E; P. O. Box 1628; tel: SU 3-5491. J. W. Atmar, Jr., Pres.; Harry Neuman, V.P.; Bryant Jones, Sec.; Vernon Van Cleve, Plant Mgr.; Arthur P. Bell, Mgr. Pesticide Div.

ARKANSAS

BLYTHERVILLE

C—Blytheville Fertilizer Co., Inc.
Henderson Ave.; P. O. Box 619; tel: POplar 3-4471. (Subsidiary of Ark-Mo Plant Food Co., Corning, Ark.) L. G. Black, Pres.; Earl Day, Sec.-Treas.; A. O. Hallman, Mgr. 25,000 tons. 2 mills.

CORNING

Ark-Mo Plant Food Co.
Tel: UL 7-2111. L. G. Black, Pres.; M. G. Hoffman, V.P.; Earl Day, Sec.-Treas. Plants at Blytheville and Walnut Ridge, Ark.; Sikeston, Mo.

EL DORADO

Ca—El Dorado Fertilizer Co.
End S. Madison; P. O. Box 339; tel: UNION 3-3506 J. G. Wepfer & G. I. Gilmore, Owners & Operators; Felix Harris, Supt. 10,000 t. cap.; 2,000 t. stor. 1 mill; 2 belt conveyors, 2 hoppers, 3 chain conveyors; tractor shovels.

E—Lion Oil Co.

Lion Oil Bldg. T. M. Martin, Pres.; A. F. Reed, V.P. (Sales); E. W. Atkinson, V.P. & Treas.; J. B. Rogerson, V.P. (Mfg.); R. E. Meinert, V.P. (Pur.); B. L. Allen, Sec.; A. M. Sprague, Supt. 208,000 t. anhydrous ammonia cap.; 15,500 t. stor. Mfg. also aqua ammonia, pelleted ammonium nitrate, sulphate of ammonia, nitrogen fertilizer solutions and sulphuric acid.

FORT SMITH

CaGP—Fort Smith Cotton Oil Co., Inc.
723 N. 1st; P. O. Box 819; tel: SUNset 2-0351. W. H. Lillard, Pres.; M. E. Vaughan, Exec. V.P., Plant Mgr. & Pur. Agt.

HELENA

C—Delta Fertilizer Co.
P. O. Box 105; tel: HI 4-7406. Earl Wells, Pres.; Tom Gist, V.P.; J. J. White, Sec.-Treas.; F. L. Enlow, Mgr. 18,000 t. cap.; 11,000 t. stor. 1 mill, all mechanized equipment.

LITTLE ROCK

Olin Mathieson Chemical Corp.—Western Fertilizer Div. & Western

Sulphur and Acids Div.

Tel: FRanklin 6-2471. Executive Ofcs: S. L. Nevins, Operating V.P.; J. H. McGalin, Western Regional Traffic Mgr.; B. B. McLendon, Cont.; L. C. Miller, Pur. Agt.

Western Fertilizer Div.

Joseph Mullin, Jr., Gen. Mgr.; S. Cottrell, Dir. of Oper.; G. A. Wakefield, Dir. Sales; P. F. Schowengerdt, Gen. Sales Mgr.; C. G. Gran, Mgr. Sales Devel.; Thomas W. Crockett, Mgr. Irrig. Dr.; U. S. Jones, Mgr. Agric. Devel.; M. S. Elliott, Mgr. Sales Svc.; R. M. Morehead, Dist. Sales Mgr.; B. W. Knowles, Mgr. Ammonia Sales; E. Hughes, Credit Mgr. Plants at: Phoenix, Ariz.; N. Little Rock, Ark.; Pasadena, Texas.

Western Sulphur and Acids Div.

W. W. Lehle, Gen. Mgr.; J. S. Gilliam, Dir. of Operations; D. B. Dickey, Dir. Sales. Plants at: N. Little Rock and Stamps, Ark.; Bossier City, La., Beaumont, Houston and Port Arthur, Texas.

C—Rose City Cotton Oil Mill Co.

A. B. Cobb, Pres.; W. G. Alexander, V.P.; W. F. Bates, Sec.-Treas.; Louis S. Ouzts, Supt. 10,000 t. cap.; 5,000 t. stor. 1 mill, 30 t./hr.

C—The Southern Cotton Oil Co.

P. O. Box 30; tel: 9277, L.D. 11,144-159. (Main ofc: New Orleans, La.) C. M. Smith, Mgr.

MAGNOLIA

CaPb—Ark-La Feed & Fertilizer Co.
412 N. Clay St.; tel: L.D. 9, 131. Joe F. Rushton, Pres.; M. E. Peace, V.P.; W. C. Blewster, Treas.; J. N. Williams, Sec. & Gen. Mgr.; Edward Baker, Supt. 5,000 t. cap.; 2,000 t. stor. 1 mill, 1 ton; hoppers; tractors; shovels.

NORTH LITTLE ROCK

Ba—Arkansas Plant Food Co.

801 Palm St.; P. O. Box 112; tel: WIndsor 5-2341. Joe C. Hardin, Pres., Board of Directors; Waldo Frasier, Exec. V.P.; M. D. Broadfield, Gen. Mgr.; James D. Campbell, Sec.-Treas.; Lloyd A. Dhonau, Sales Mgr.; A. N. Gentry, Prod. Mgr. 50,000 tons, 4 mills, 30-40 t./hr. each; complete hopper systems; conveyors; tractor shovels; anhydrous ammonia and nitrogen solution storage tanks.

AEPi—Olin Mathieson Chemical Corp.

(Plants formerly operated by Ark. Fert. Div., Southern Acid & Sulphur Co. and by Temple Cotton Oil Co.) Tel: WIndsor 5-2351. (Main ofc: Little Rock, Ark.) **Western Fertilizer Div.:** R. E. Erwin, Plant Mgr. 4 mills, cap. 44, 22, 22 and 37 tons per hr.; bag belt conveyor. **Western Sulphur and Acids Div.:** O. W. Taylor, Acid Plant Supt.

C—Virginia-Carolina Chemical Corp.
Tel: WIndsor 5-9245 & WIndsor 5-1032. (Main ofc: Richmond, Va.)

PINE BLUFF

CaPb—Planters Fertilizer & Soybean Co.
1021 E. 5th; P. O. Box 895; tel: 166. Geo. H. Dunklin, Mgr.; Wm. H. Dunklin, Asst. Mgr.; J. R. Huneycutt, Supt. 15,000 tons.

SPRINGDALE

C—Tri-State Chemical Co.

(Main ofc: Webb City, Mo.) Tel: 702. Milo Johnson, Pres.; L. J. Sa-

H—Offer liquid applicator service
 L—Mix complete liquid fertilizers
 O—Process organic materials
 P—Sell pesticides

b—buy from outside source
 f—formulate
 m—mix with fertilizers
 s—Mfg. specialty or shelf goods

*—Current information not received in time for publication
 —No key indicates main or divisional office, no plant at this location

vana, V.P. C. H. Casey, Sec.-Treas.; Frank Sizemore, Resident Mgr. 20,000 tons.

TEXARKANA

Farmers Fertilizer Co.
 (See Texarkana, Texas)

Ba—International Minerals and Chemical Corp.
 P. O. Box 928; tel: 2-3158, 2-3159. (Main ofc: Chicago, Ill.) W. Q. Burns, Area Mgr.; H. E. Brooks, Dist. Sales Mgr.; G. A. Feagin, Supt.

WALDO

Ca—Waldo Fertilizer Works
 P. O. Box 307; tel: 3431. W. H. Ellis, Pres.; E. H. Felty, Sec.-Treas.; J. W. Williamson, Supt. 10,000 t. cap.; 7,500 t. stor. 1 mill; 2 Payloaders; belt conveyors.

WALNUT RIDGE

BagFP—Ark-Mo Plant Food Co., Inc.
 Tel: 616. (Main ofc: Corning, Ark.) L. G. Black, Pres.; Fermont E. Lange, V.P., Gen. Mgr. & Plant Mgr.; Earl Day, Sec.-Treas.; Rex L. Morgan, Sales Mgr.; M. G. Hoffman, Traffic Mgr. 100,000 t. cap.; 35,000 t. stor. 2 mills; complete equipment for granulation, automatic feeding, drying, cooling, coating.

WARREN

Ca—Warren Cotton Oil & Mfg. Co.
 117 Scotta; tel: 207, L.D. 1. E. L. Wise, Pres.; E. F. Paulus, Jr., V.P. & Mgr.; Virgil Gambell, Supt. 10,000 t. cap.; 3,000 t. stor. 1 mill, 1 ton; conveyors; power shovels.

CALIFORNIA

ALTADENA

The Calunite Corp.
 General Offices: 3090 Lincoln Ave.; P. O. Box 538, Figueroa Sta.; tel: SYcamore 8-1411. Bradley A. Walker, (New York, N. Y.) Pres.; J. A. Williams, V.P.; Hugh S. Graham, V.P.—Distr. & Sales; Raymond V. Testa, (New York, N. Y.), Controller. (Executive offices: New York, N. Y.; mill & mines: Marysville, Utah; plant at Pomona, Calif.; contract plants at Little Rock, Ark.; Stockton, Calif.; Sulphur Springs, Tex.; Midvale, Utah. Fertilizers of mixed alunite, superphosphate & ammonium sulphate. 150,000 tons.

AZUSA

CFP—Growers Chemical Supply Co.
 930 W. 10th St., tel: EDgewood 4-4995 (Plant). T. A. Barnard, Pres. 10,000 tons.

Soluble Plant Nutrients Co.
 P. O. Box 305; 471 Foothill Blvd. J. Johnson, 25,000 tons. Plant also at Augusta, Kans.

BAKERSFIELD

CP—International Fertilizer & Feed Co.
 1016 E. Brundage Lane; P. O. Box 62; tel: FA 3-7506. Harry Amenta, Pres.; Oscar Rudnick, V.P.; Herman L. Boyd, Sec.; Samuel J. Amenta, Treas.; Vincent P. Amenta, Plant Mgr. Have merged fertilizer division with Plant Food Corp., Los Angeles, and are operating from above address.

CLPf—Plant Food Corp.
 Tel: FAirview 2-2735; (Main ofc: Los Angeles, Calif.) J. J. Bingham, Mgr.

BERKELEY

CagFGHLPfm—Pacific Guano Co.
 1832 2nd St.; tel: THornwall 7-7120. W. G. Hewitt, Pres. & Gen. Mgr.; H. G. Conley, V.P. & Sou. Div. Mgr.; R. J. Crum, V.P. & Nor. Div. Mgr.; G. A. Hall, Sec.; F. W. Doyle, Treas.; F. Zwart, Cont.; Paul Frei, Supt.; R. H. Bahme, Mgr. Ag-Chem. Dept. 80,000 t. cap.; 5,000 t. stor. 2 mills; all mechanized equipment. Branches at Holtville & Los Angeles, Calif., and Tolleson, Ariz.

BLYTHE

LDPf—The Arical Co., Inc.
 425 W. Chanslorway; tel: 4444. Donald S. Keyfauber, Pres. & Mgr. Pest. Div.; Frank M. Feffer, Sr., V.P.; Hugh H. Helm, Jr., Sec.-Treas.; M. F. Wharton, Sr., Asst. Sec.-Treas.; Roy C. Wolven, Plant Mgr. 400 tons storage capacity.

BORON

E—Pacific Coast Borax Co.—Div. Borax Consolidated, Ltd.
 (Main ofc: Los Angeles, Calif.) Borates plant.

BRAWLEY

L—Tank Fertilizer, Inc.
 8th & C Sts.; P. O. Box 176; tel: 233. R. B. Wilson, Pres.; W. F. Aycock, V.P., Treas. & Pur. Agt., Plant Mgr.

BREA

EL—Brea Chemicals, Inc.
 15401 Imperial Highway. (Main ofc: Los Angeles, Calif.) Robert S. Ray, Mfg. Mgr., Robert S. Ogilvie, Plant Supt. Ammonia: 78,500 t. cap.; 23,000 t. stor. (including terminals). Ammonium nitrate: 50,000 t. cap.; 10,000 t. stor. Manufacture liquid 8-24-0 ammonium phosphate and ammonium nitrate in prilled and solution forms. Bagging equipment; conveyors; fork lift tractor; Payloader.

CAMPBELL

DFGHL—Garden Valley Fertilizer Co.
 657 S. San Jose-Los Gatos Hwy.; P. O. Box 522; tel: FR 8-2239. D. L. Watts, Pres.; A. Ferrari, V.P. & Sec.-Treas. 300,000 gal. liq. fert.

CAWALO

S. A. Camp Fertilizer & Insecticide Co.
 S. A. Camp, Pres.; James Y. Camp, V.P.; M. L. Thomas, Sec.-Treas. Plant at Shafter, Calif.

CHICO

LH—Farmers Chemical & Fertilizer Co.
 Rte. 3, Box 11; tel: Fireside 2-1511. Jack L. Rawlins, Pres.; James Morehead, V.P.; George J. Nisson, Sec.-Treas. & Plant Mgr. 9,500 t. cap.; 175,000 gal. stor.

CHULA VISTA

CLPf—General Fertilizer & Supply Co.

2320 Main St. (Otay); P. O. Box 865; tel: GARfield 2-2955. Jno. N. Williams, Pres.; Walter L. Steele, V.P.; R. K. Williams, Jr., Sec.-Treas.; P. F. Edmundson, Plant Mgr.; E. Hurley, Mgr. Pest. Div. 3,000 t. cap.; 300 t. stor. 2 mills; chain drags; bucket elevators; tractor shovel.

CFLPf—Wilbur-Ellis Co.
 696 Naples St.; P. O. Box 119; tel: GARfield 2-5321. (Main ofc: Los Angeles, Calif.) Frank J. Scoville, Mgr.

DOWNEY

CFLPbf—Downey Fertilizer Co.
 9447 E. Imperial Hwy.; tel: LU 1-6261. Ben Mooschekian, Sam Mooschekian, Roy Mooschekian, Ted Mooschekian, Ardie Babajian, Arnold Babajian, Chas. Monoogian, Fred Nemoede, Partners. Roy Mooschekian, Plant Mgr.; Chas. Monoogian, Pur. Agt. 25,000 t. cap.; 2,000 t. stor. 4 mills, ½ ton each; conveyors; hopper systems; tractors; shovels.

DURHAM

CFHPbm—Liston Warehouse
 Tel: Fireside 2-4017. Emory E. Liston, Ptnr. & Plant Mgr.; Duncan E. Liston, Ptnr. 1,000 t. cap.; 300 t. stor. 1 mill; 3-ton mixer; pit; elevator; sacking bin; sewing machine.

EDISON

CagPf—AFC, Inc.
 P. O. Box 11; tel: (Bakersfield) EMpire 6-7221. James Bonaventura, Pres. & Pur. Agt.; Frank Waterman, Sec.-Treas. & Prod. Mgr.; Fred Bonaventura, Plant Mgr.; Tom Vedder, Mgr. Pesticide Div. 50,000 t. cap.; 5,000 t. stor.; 1 mill, 30 t./hr.; belt conveyor; fully mechanized from car to bag or bulk delivery.

L—B & W, Inc.

P. O. Box 26; tel: (Bakersfield) EMpire 6-7221. Frank Waterman, Pres. & Prod. Mgr.; James Bonaventura, V.P. & Pur. Agt.; Edwin Hartwell, Plant Mgr. 10,000 t. cap.; 1,000 t. stor.

EL MONTE

C—Min-A-Ray Products Co.
 1620 Gidley St.; tel: FOrest 0-1595. Mathew P. Thommes, Owner & Mgr. 2,500 tons. 1 mill, 25 tons per day; 1 conveyor; 1 hopper; 1 elevator; fork lift truck with shovel attached.

C—Terra Food Fertilizer Co.
 3038 Lower Azusa Rd.; tel: FOrest 8-7874. D. J. Slattery, Pres.; D. D. Foss, Sec.-Treas. 10,000 t. cap.; 800 t. stor. 1 mill, 1 ton.

FRENCH CAMP

C—Orfac Corp.
 P. O. Box 323; tel: HOward 2-4696. Andrea Gusmano, Pres.; Robert Hinckley, Plant Mgr. 5,000 t. cap.; 5,000 t. stor. 2 mills, 25 tons each; hopper system; conveyors; tractors; pallets; lift trucks. Plant also at Stockton Calif.

FRESNO

CF—Emco Co.
 4607 E. Harvey; tel: 5-1586. Mitchell Scaff, Owner; Victor Chacon, Plant Supt. 1,000 t. cap.; 600 t. stor. Hop-

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
a—ammoniate g—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

per; mixer; 2 elevators; tractor shovel; 2 trucks; spreaders; valve bagger.

CHLPf—Fresno Agricultural Chemical Co.—Div. Wilbur-Ellis Co.
Hwy. 99 at Cedar Ave.; P. O. Box 1286; tel: 3-6245. (Main of: Los Angeles, Calif.) John Parker, Mgr.; J. W. Chapman, Sales Mgr.; R. M. Marshall, Supt.; Ivan Smith, Mgr. Pest. Div. 1 Raymond mill; hoppers; belt conveyors.

HL*—Modern-Ag Crop Service
2051 Anna St. Partnership—A. V. & C. E. Jenan. H. D. Stephenson, Plant Mgr. 2,000 tons.

BagFHLFm—Sunland Industries, Inc.
Sunland Ave.; P. O. Box 1669; tel: 6-9881. B. H. Jones, Pres.; Frank A. Easton, V.P. & Gen Mgr.; Dr. G. F. MacLeod, Tech. V.P.; Hugo Klein, Supt.

GARDEN GROVE

HL—Cactisoma Manufacturing Co.
13042 Euclid Ave.; tel: LEhigh 9-1711. J. A. McAvoy, Pres. & Owner; Chester L. White, Plant Mgr.

GARDENA

L*—Yamada Co.
706 Gardena Blvd. Partnership. George Kuwahara, Nobe Kuwahara, Shoso Kuwahara (Pur. Agt.), Talcuo Kuwahara (Prod. Mgr.). 2,000 to 3,000 tons.

GLENDALE

S—Leon's Horticulture Specialties Co.
433-B West Magnolia Ave. (4); tel: CItirus 3-4021. Leon Blasczyk, Owner. 50-75 t. cap.; 300 t. stor.

GLENDORA

C—Golden State Plant Food Co.
7034 N. Valencia St.; tel: ED 5-4516, ED 5-1500. Herman Sperber, Pres.; Howard H. Hawkins, V.P.; Eugene B. Chewning, Sec.-Treas.; James Dittberner, Supt. 4,000 t. cap.; 200 t. stor. 1 mill, 1 ton; tractor shovel.

GLENN

CFP—Sacramento Valley Milling Co.
RFD; tel: (Willows) 498. Wilbur White, Owner; Chas. Baker, Plant Mgr.

HAMILTON CITY

D—James Mills Growers Service Co.
Tel: 2801. James Mills, Jr., Pres.; Fred Shanks, V.P.; Alfred Tisch, Treas. Temporarily discontinued manufacturing own goods; operating as dealer in interim.

HAWARD

C—Swift and Co., Plant Food Div.
1225 Winton Ave.; P. O. Box 540; tel: LUcerne 1-3824. (Main of: Chicago, Ill.) M. C. McNeil, Mgr.

HOLTVILLE

HLF—Agriform Co., Inc.
(Main of: Santa Ana, Calif.) 35,000 t. cap.; 120,000 gal. stor.

CFHLFm—Pacific Guano Co.
(Main of: Berkeley, Calif.)

IMPERIAL

LHDP—Wynns Fertilizer Co.
Ofc: Brawley, Calif.; plant: 2nd & K Sts.; P. O. Box 474; tel: (Brawley) 8708-R3. W. C. Wynns, Owner. 500 tons storage.

LANCASTER

CPb—Lloyd Newell, Inc.
P. O. Box 791; tel: 81. Lloyd Newell, Pres.; V. D. Fairchild, V.P.; M. E. Trammell, Sec.-Treas. & Plant Mgr. 2,000 t. cap.; 300 t. stor. 1 mill.

LATHROP

Bg—The Best Fertilizers Co.
P. O. Box 198; tel: MAntecca 555. (Main of: Oakland, Calif.) Al Roecks, Plant Mgr. 60,000 t. cap.; 25,000 t. stor.

LINDSAY

CP—Orange Belt Supply Co.
Blue Gum Ave.; P. O. Box 246; tel: 2-2574. A. R. Wakefield, Pres.; R. M. Cook, V.P.; Raleigh Black, Sec.-Treas.; Bruce Graves, Gen. Mgr. 1,500 t. cap.; 300 t. stor. 1 mill.

LODI

AFG*Lodi Agriculture Suppliers, Inc.
P. O. Box 272; 11 E. Vine St.; tel: 9-2650. Robert H. Baldocchi, Pres. & Prod. Mgr.; Joseph Baldocchi, V.P., Treas., Plant Mgr. & Mgr. Pesticide Div.; A. W. Geith, Sec. 25,000 tons.

LOS ANGELES

EgPf—American Potash & Chemical Corp.

3030 W. 6th St. (54); tel: DUnkirk 2-8231. Peter Colefax, Pres., W. J. Murphy, V.P.—Sales; E. M. Kolb, Eastern Gen. Sales Mgr.; W. J. Francis, Western Gen. Sales Mgr.; C. L. Dickinson, (Trona, Calif.), Dir. of Mfg.; A. F. Swain, Mgr. Pesticides Div. (L. A. Ofc.). Plants also at Trona, Calif., and San Antonio, Texas. 225,000 tons muriate and sulphate of potash.

E—The Baker Castor Oil Co.

(Main of: New York, N. Y.) Castor meal & pomace plant.

C—Bandini Fertilizer Co.

4139 Bandini Blvd. (23); tel: ANgelus 3-7391. Byron Reynolds, Pres.; Thos. S. Reynolds, V.P. & Sec.; Jack Baker, Treas. & Gen. Mgr. 10,000 t. cap.; 2,000 t. stor. 1 mill, 1 ton.

Brea Chemicals, Inc.

714 W. Olympic Blvd. (15); tel: Richmond 7-0116. W. L. Stewart, Jr., Board Chmn.; Homer Reed, Pres.; J. W. Miller, Exec. V.P.; H. R. Fifer & H. W. Sanders, V.P.'s; I. J. Hancock, Treas.; Paul Foreman, Sec.; Max Lorimore, Comp.; Robert S. Ray, Mgr. Mfg. Plant at Brea, Calif.

C—California Sun Fertilizer Co.

4065 Bandini Blvd.; tel: ANgelus 8-6196. J. M. Quinn, Owner; E. R. Lindberg, Mgr.; Elston Huston, Plant Foreman. 1 mill; fork lift; Payloader; bulk unloading conveyors; valve packer.

BPf—Inland Fertilizer Co., Inc.

4134 Bandini Blvd. Mrs. Hazel I. Dunford, Pres.; Frank Frazier, V.P. & Gen Mgr.; Jack Dunford, Sec.-Treas. & Asst. Gen. Mgr.; Norman McNew, Supt.; Tom Glenn, Mgr. Pest. Div. 50,000 t. cap.; 10,000 t. stor. Hopper systems; conveyors; tractor shovels.

CFPh*—Kellogg Supply Co.

(Main of: Wilmington, Calif.) 4130 Bandini Blvd. Rowland E. Myers, Mgr.; Roy Brown, Supt. 30,000 tons.

Pacific Coast Borax Co.—Div. Borax Consolidated, Ltd.

630 Shatto Pl.; P. O. Box 75128, Sanford Sta. (5); tel: DUnkirk 7-5151. J. M. Gerstley, Pres. & Gen. Mgr.; P. J. O'Brien, V.P. & Asst. Gen. Mgr.; R. F. Steel, Sec. Plants at Boron & Wilmington, Calif.

CHLPfm—Pacific Guano Co.

4522 Worth St.; P. O. Box 3819, Terminal Annex; tel: ANgelus 1-8114. (Main of: Berkeley, Calif.) H. G. Conley, V.P. & Sou. Div. Mgr.; C. H. Cornell, Sou. Div. Supt.; Dr. R. H. Bahme, Mgr. Pesticide Div. 50,000 t. cap.; 4,000 t. stor. 3 mills, 200, 80 & 50 tons daily each; practically all mechanized.

CL—Parco, Inc.

3818 Bandini Blvd.; tel: ANgelus 2-1171. E. Thacher, Pres.; John J. McGrath, Treas.; Geo. W. Burch, Jr., Sec. 15,000 t. cap.; 3,000 t. stor. 2 mills, 100 tons daily; full conveyors and hoppers for both fertilizer and tankage depts.; tractor shovels.

CLPf*—Plant Food Corp.

3711 Medford St.; tel: ANgelus 3-6971. John E. Campbell, Pres.; M. W. Mothershead, V.P. & Sec.; Chas. D. Black, Plant Mgr. 20,000 tons. Plants also at Bakersfield & Pomona, Calif.

C—Southern California Fertilizer Co.

1709 W. 8th St.; tel: DUnkirk 7-8271. T. Walter Houser, Pres. & Pur. Agt.; Irma Jane Brown, Sec.-Treas.; Robert J. Gales, Plant Mgr. 6,000 t. cap.; 1,000 t. stor. 1 mill; ½ ton mixer.

C—Swift & Co.—Plant Food Div.

4060 E. 26th St. (23); tel: ANgelus 7211. (Main of: Chicago, Ill.) Henry C. Hopewell, Mgr.

CL—United Sulphur Co.

3709 Medford St. Harry A. Medley, Pres.

CagFLPFm—Wilbur-Ellis Co.

1206 S. Maple Ave.; tel: RIchmond 8-5361. Brayton Wilbur, Pres.; Ned Lewis, V.P.; Wm. E. Snyder, Gen. Mgr. & Mgr. Ag. Chem. Dept.; Donald Holland, Plant Mgr.; John Parker, Mgr. Pesticide Div. 30,000 t. cap.; 3,500 t. stor. 2 mills, 12 tons/hr.; 10,000 & 20,000 annual tons; bulk unloading conveyor systems; fork lifts; Payloaders; hoppers, etc. Plants also at: Chula Vista & Fresno, Calif.; Portland, Oreg.; Seattle, Wash.

MARTINEZ

CaPm—The Mountain Copper Co., Ltd.

100 Mococo Rd.; tel: 2057. (Main of: San Francisco, Calif.) H. C. Vickery, Plant Mgr. 20,000 t. cap.; 5,000 t. stor. 2 mills, 50 & 40 tons per shift; incoming bulk storage conveyor system; outgoing bulk loading conveyor system; fork lift truck; 2 Hough Payloaders.

MODESTO

CaFHL—Chemical Fertilizer Co., Inc.

Claus & Sylvan Rds.; P. O. Box 1443; tel: 2-1087. Harry M. Pierce, Pres. & Sales Mgr.; Duncan A. Sim, V.P. & Gen. Mgr.; Donald J. Hicks,

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
S—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

Treas. & Cont.; Donald A. Jaynes, Board Chmn.; A. B. Anderson, Asst. Sales Mgr. 60,000 t. cap.; 7,000 t. stor. Complete dry & liquid mixers; aqua converter; fork lifts; loaders; elevators; hoppers.

C—Haas Ammonia & Fertilizer Co.
P. O. Box 826; tel: 7-0701. C. H. Haas, Pres.; O. B. Haas, V.P. 20,000 t. cap.; 3,000 t. stor. 1 mill; hopper systems; conveyors. (Plant at Ceres, Calif.)

MONROVIA

HL—Liquid Plant Food

1726 S. Magnolia Ave.; tel: ELliott 8-8377. R. J. Nichols, Pres.; Ruth A. Nichols, V.P.; Robert A. Nichols, Sec.-Treas.; C. E. Blankenship, Plant Mgr. 500,000 gal.

MOUNTAIN VIEW

CFLPf—A. L. Castle, Inc.

P. O. Box 308. Thomas S. Castle, Pres.; B. L. Wilson, V.P. 6,000 tons.

OAKLAND

A—The Best Fertilizers Co.

1459 3rd St. (20); tel: GLencourt 1-4260. Lowell W. Berry, Pres.; F. B. Hornibrook, V.P.; David M. Sansome, Asst. to Pres.; D. Rooney, Asst. to Pres.; A. Roocks, Plant Mgr. 200,000 tons. Plants also at: Lathrop, Calif., and Houston, Tex.

CLPf—Britz Chemical Co.

304 7th Ave. Albert Britz, Pres.; Helen Britz, V.P. & Treas.; Joseph M. Payer, Sec. 6,000 tons.

E—Kaiser Steel Corp.

1924 Broadway. B. N. Dagan, Works Mgr.; C. R. Lohrey, Asst. Gen. Supt.; G. W. Kelly, Pur. Agt. 25,000 tons ammonium sulphate. 1 mill; Swenson filter; Kiln drier; 3 belt conveyors; 3 screw conveyors; bagging machine.

ONTARIO

C—Ontario Fertilizer Works, Inc.

810 E. Main St.; P. O. Box 351; tel: 6-1189. Sidney Herzberg, Pres.; Harvey Herzberg, V.P.; S. H. Yahres, Sec.-Treas.; Winnie Catherall, Asst. Sec.; Efrén Olivarez, Supt. 15,000 t. cap.; 1,500 t. stor. 2 mills; 50 tons daily; drag chains (no belts); horizontal mixers.

ORANGE

LH—Liquinox Co.

1409 W. Chapman Ave.; tel: KEllogg 8-3568. Harry C. Garner, Gordon X. Richmond & Howard H. Heilman, Ptnrs. 3,000 t. cap.; 300 t. stor.

PALO ALTO

Cg—Nitrogen Products Corp.

2377 Pulgas; tel: DA 2-7164. Grayson Hinceley, Jr., Mgr. 2,000 tons.

S—Plantsmiths

P. O. Box 818. E. F. Smith, Owner. 100 tons. (Small package goods only.)

PASADENA

L—California Liquid Fertilizer Co.
Box 669; tel: SYcamore 6-3129. RYan 1-7288. J. J. Crosby, Pres.; J. M. Crosby, V.P.; Warren L. Weber, Sec.; Chester C. Halsey, Treas. 1,000,000 gal.

C—Coast Agricultural Fertilizer Co.
2785 E. Foothill Blvd.; tel: SYcamore 3-0374. Mrs. Helen L. Long, Owner. 550 t. cap.; 500 t. stor.

PITTSBURG

E—Shell Chemical Corp.

P. O. Box 431; tel: Gladstone 8-3222. (Main ofc: New York, N. Y. Ammonia Div. ofc: San Francisco, Calif.) E. S. Bodine, Plant Mgr. Anhydrous ammonia & ammonium sulfate.

POMONA

C—Plant Food Corp.

P. O. Box 499; tel: LYcoming 4-0000. (Main ofc: Los Angeles, Calif.) Keith Annis, Mgr. 5,000 tons.

REEDLEY

CaFHL—Growers Supply Co.

953-963 G St.; tel: 44, 45. N. H. Mortensen, Pres.; Agnes E. Mortensen, V.P. & Treas.; E. A. Jensen, Sec.; W. E. Baker, Plant Mgr. 40,000 t. cap.; 2,000 t. stor.

RICHMOND

CDPf—California Spray-Chemical Corp.

Lucas & Ortho Way; tel: BEacon 5-1060. A. W. Mohr, Pres.; E. W. Cannon, V.P. & Mgr. Marketing; L. R. Gardner, V.P. & Mgr. Research & Devel.; P. S. Williams, V.P. & Chief Engr.; H. J. Grady, V.P. & Regional Mgr. (East), Marketing Dept.; W. W. Layne, Asst. Sec.-Treas. and Compt.; C. E. Cody, Regional Mgr. (West), Marketing Dept.; C. E. Jones, Jr., Mgr. Merchandising Div.; L. R. Hudson, Mgr. Sup. & Trans. Div. (Pur. Agt.); Frank J. Juchter, Mgr. Mfg. Dept.; L. R. Hamilton, Coordinator of Fert. Oper.; Calvin Dorrough, Supt. Fert. Mfg. New 4-struction; scheduled for summer '56 operation.

AgPf—Stauffer Chemical Co.

1415 S. 47th St.; tel: LAndscape 6-9660. (Main ofc: New York, N. Y.; Ag. Chem. Div. ofc: San Francisco, Calif.) D. J. Keating, Dir. Sales Ag. Chem.; J. S. Edwards, Jr., & R. V. Wallace, Plant Mgrs.

HLPf—United Fertilizer Co.

600 S. 4th St.; tel: La 5-9210. E. S. Heckathorn, Pres.; Ivor R. Borden, V.P. & Gen. Mgr.; Peter Cherian, Sales Mgr.; E. G. Trimpey, Plant Mgr.

RIVERSIDE

HL—Ahlsweide Fertilizer Co.

P. O. Box 81 (Arlington); tel: 9665. Karl P. Ahlsweide, Owner. 40,000 gal.

CPb—Riverside Fertilizer Works

2622 3rd St.; P. O. Box 232; tel: Overland 6-3236. J. J. Zikratch, Plant Mgr. 6,500 tons. 1 mill.

SACRAMENTO

HL—Crane Fertilizer Co.

Rt. 3, Box 1295; tel: WAbash 2-0462. Lewis D. Crane, Owner. 500,000 gal. cap.; 200 t. stor.

CPb—Mackenzie Chemical Corp.

P. O. Box 2489; tel: HI 7-6534. Charles Mackenzie, Jr., Pres. & Mgr. Pesticide Div.; Mally C. Mackenzie, Sec.-Treas. 6,000 tons.

CFHLPb—John Taylor Fertilizer Co.

N. 13th St. & E. El Camino Ave.; P. O. Box 781; tel: WAbash 5-8501. John H. Taylor, Owner. 4,000 t. cap.; 2,000 t. stor. 1 mill; aqua ammonia converter; 180,000 gal. stor.

SALINAS

CFPm—Associated Chemicals

Salinas-Castroville Rd.; P. O. Box 1330; tel: 26-452. W. B. Dickens, Sr., Owner, Pur. Agt.; James A. Bergh, Mgr. Pest. Div. 10,000 t. cap.; 1,000 t. stor. 1 mill, 40 t./day. 2 power shovels; 2 baggers; 3 elevators; 400 ft. conveyor belt; 500 ton curing bins. Warehouse also at Cupertino & Watsonville, Calif.

CaFHPb—J. F. Sloan Co.

Railroad Yards; P. O. Box 657. J. F. Sloan, Pres.; Mordy S. Rose, V.P.; May J. Sloan, Sec.-Treas.; Ed Marks, Plant Mgr.; A. P. Babcock, Mgr. Pesticide Div. 25,000 t. cap.; 1,000 t. stor. 1 mill, ½ ton batch—40 tons per day; belt conveyors; hopper system; 2 tractor shovels.

CF—E. B. Stone & Son

P. O. Box 57. E. B. Stone, Sr., & Bruce Stone, Ptnrs. 10,000 tons.

CaFHPf—Triangle Co. of Central California

320 W. Market St.; P. O. Box 1289; tel: 4843. W. E. Simas, Pres.; V. A. Frizzell, V.P. & Gen. Mgr.; E. E. Kaplansky, Treas.; Albert Reposas, Plant Mgr.; Otto Schwab, Mgr. Pest. Div. 50,000 tons. 2 mills, 1 ton & ¼ ton; conveyors; elevators; fork lifts; Payloaders; bagging & sewing machine; aqua ammonia converter.

SAN BERNARDINO

CHPf—Hager Supply Co.

J. W. Hager, Pres.; Margaret Hager, Sec.; Laurence LaFontain, Supt. 2,000 tons.

SAN FRANCISCO

O—Atlas Fish Fertilizer Co.

#1 Drumm St.; tel: DOuglas 2-2272. Miss Pearl R. Parr, Pres.; L. F. Mezera, Gen. Mgr. fish emulsion. Packaging plants at Oakland and Los Angeles, Calif.; warehouse at Baltimore, Md.

Consolidated Chemical Industries, Inc.

Executive Offices: 111 Sutter St. (4); tel: SUTter 1-8370. Geo. L. Bond, Pres.; E. S. Rothrock (Houston, Tex.), Exec. V.P.; S. S. Emison (Houston, Tex.), V.P., Sales Mgr.; C. M. Hickey (Houston, Tex.), V.P., Mgr. of Mfg. Southern Div. ofc.; Houston, Tex. Plants at Baytown, Ft. Worth & Houston, Tex.; Baton Rouge, La. Mfg. Sulphuric Acid.

OEag—Green Goddess, Inc.

1700 Jerrold St.; tel: VAlencia 6-6200. R. J. Fouts, Pres. & Mgr.; Eileen Holroyd, V.P.; Allen A. Holroyd, Sec.-Treas. 9,000 t. cap.; 400 t. stor. Bulk bins; screw conveyor system; open mouth bagging equipment; fork lift; installing pelletizer (rotary) of own design. Process sewage sludge and add ammonium sulfate and phosphoric acid to produce 6-3-0 for nursery trade.

CDPm—Jessup Milling Co.

458 Jackson St. (11); tel: DOuglas 2-3975. J. R. Walsh, Pres.; M. A. Walsh, Sec.; V. J. Walsh, Treas. Hoppers; mixers; elevators.

The Mountain Copper Co., Ltd.

230 California St.; tel: EXbrook 2-0362. L. T. Kett, Gen. Mgr.; J. G. Huseby, Asst. Mgr.; S. D. Dodds, Pur. Agt.; M. M. Stockman, Sales Mgr. Plant at Martinez, Calif.

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
 a—ammoniate g—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

E—Shell Chemical Corp.—Ammonia Div.

100 Bush St.; tel: EXbrook 2-5400. (Executive offices: New York, N. Y.) R. C. McCurdy (N. Y.), Pres.; G. R. Monkhouse, V.P., Ammonia Div. (San Francisco). Plants at: Pittsburg & Ventura, Calif.; dist. terminals at Phoenix, Ariz.; Imperial, Kerman, Norwalk, Calif.; Portland, Oreg.; E. Pasco, Wash. Gross output 175,000 tons ammonia.

Stauffer Chemical Co.

Western ofc: 636 California St. (Zone 8); tel: SUTter 1-5350. Christian de Guigne, Chmn. of Board; Hans Stauffer, Pres.; John Stauffer, V.P., Sec. & Chmn. Exec. Comm., C. de Dampierre, Treas.; R. W. Gunder, Mgr. Western Operations; Dr. M. L. Spealman, West. Div. Prod. Mgr.; A. C. Mohr, Chief Egn.; E. B. Donaldson, Pur. Agt.; R. A. Lamoree, Western Div. Ag. Chem. Sales Mgr. Plants at Richmond, Calif. (sulphuric acid, and normal superphosphate); Vernon, Calif. (sulphuric acid, normal and ammoniated superphosphate, mixed fertilizers); Tacoma, Wash. (normal superphosphate and ammonium phosphate-sulphate).

SAN JOSE

O—Crown By-Products Co.

Brokaw Rd.; P. O. Box 347; tel: CYpress 2-0922. Lloyd Hygelund, Mgr. 1,000 t. cap.; limited storage. 1 mill, 5 tons: complete mechanized handling.

O—Norsco Products, Inc.

Rte. 4, Box 185, Coyote Rd.; P. O. Box 456; tel: CYpress 2-7071. Olaf A. Hansen, Pres. & Plant Mgr.; James T. Howell, V.P.; D. G. Hansen, Treas.; Kathleen C. Howell, Sec. 5,000 t. cap.; 50 t. stor. Hammer mill; shaker screen; bucket conveyor; hopper.

CF—Northern California Fertilizer Co.

901 N. 10th St.; tel: CYpress 2-7217. Mrs. E. Miller, Pres.; Thos. R. Mat-suoka, V.P.; Henry T. Ishigaki, Treas.; Yoneo Bepp, Sec. & Gen. Mgr. 5,000 t. cap.; 500 t. stor.

CFPB—Orchard Supply Building Co.

720 W. San Carlos St.; tel: CYpress 2-6282. W. W. Curtner, Pres.; H. O. Willson, V.P.; K. J. Lewis, Sec. Treas., Supt., Mgr. Fert. Dept. & Pur. Agt.; James Klemas, Plant Mgr. 1 one-ton MacLellan batch mixer, model 10; 1 30-ft. Union conveyor belt.

SANTA ANA

Agriform Co., Inc.

Main office. 14922 Harbor Ave.; P. O. Box 1707; tel: Kimberly 7-1648. John C. Anderson, Pres. & Gen. Mgr.; D. W. Galbraith, V.P.; W. C. Rockwell, V.P.; J. N. Galbraith, V.P. & Sec.; Harvey Stonehouse, Treas. Plants at Yuma, Ariz.; Holtville, Wasco & Woodland, Calif. Distributing Bulk Plants throughout California and at Pasco, Wash.

SANTA CLARA

L—Cagmar Chemical Co.

Bayshore at Lawrence Rd.; Route 1, Box 1888; tel: RE-6-8686. Jim Caglia, Pres. & Mgr.; R. Caglia, Sec.; R. Martin, Pur. Agt. 300 tons cap. (25,000 gal.); 200 t. stor.

SANTA MARIA

LH—Fertile Plant Food Co.

P. O. Box 473; tel: 5-7612, 5-6924. G. M. Lindblad, Owner. 20,000 gal. cap.; 2,000 gal. stor.

SHAFTER

CLPbf—Brown & Bryant

402 Central Ave.; P. O. Bin "T"; tel: 4111. Ed Brown, Fred R. Bryant, Vernon Wilson, Partners. Wilbur Stocker, Plant Mgr. 12,000 t. cap.; 3,500 t. stor. 1 mill, 80 t./day; weigh hoppers; bin loading conveyor; Pay-loader.

DLPf—S. A. Camp Fertilizer & Insecticide Co.

P. O. Bin "D"; tel: (Bakersfield) FAirview 5-0751. (Main ofc: Cowelo, Calif.) Irvin L. Nickel, Mgr.

STOCKTON

C—The Calunite Corp.

(Main ofc: Altadena, Calif.) Arthur Steiner, Supt. 25,000 tons. 1 ton dry mixer.

Cg—ORFAC Corp.

McKinley Ave.; P. O. Box 1168; tel: HOWard 2-4696. Robert Hinckley, Gen. Mgr. 5,000 t. cap.; 2,500 t. stor. 2 mills. Plant also at French Camp, Calif.

C—Growers Fertilizer Co.

336 S. Aurora St.; tel: Howard 6-7354. F. J. Jones, Owner; Earl R. Mog, Mgr.; C. D. Price, Plant Mgr. 30,000 t. cap.; 100,000 t. stor. 1 mill; 2 conveyors; hopper system. Plant also at Lovelock, Nev.

TERMINAL ISLAND

CPf—American Corp.

W. Wade Ambrose, Pres.; Mel Marsh, V.P.; Miss Norma Rogers, Treas.; Dr. H. N. Brocklesby, Sec.; John Patrick, Plant Mgr.; Jaye E. Brower, Gen. Mgr. 10,000 tons.

OL—Van Camp Seafood Co.

722 Tuna St.; tel: TE 3-4411. D. Landmeyer, Plant Mgr. 100,000 t. cap.; 100 t. stor. Clear liquid deodorized fish fertilizer of altered analysis for agriculture & domestic use.

TERRA BELLA

CFPm—Diamond Fertilizer Co.

P. O. Box "H"; tel: 2161. Walter J. Schultz, Pres.; Raymond J. Mettler, V.P.; C. S. Garber, Sec.; Ernest Carstens, Treas. 15,000 t. cap.; 12,000 t. stor. 1 mill, 2 tons; complete "car to bag" mechanization.

TRONA (Searles Lake)

EgPf—American Potash & Chemical Corp.

(Main ofc: Los Angeles, Calif.) C. L. Dickinson, Dir. Mfg.; A. F. Swain (Los Angeles), Mgr. Pest. Div. 225,000 tons muriate & sulfate of potash.

TUSTIN

CFHLPb—Larry Fricker Co.

135 W. Main St.; P. O. Box 451; tel: Kimberly 2-5330, Kimberly 2-6359. L. P. Fricker, A. V. Smith, Owner-partners. 5,000 t. cap.; 7,500 t. stor. 1 mill; bulk bins; hopper system; 3 conveyors; elevators; tractor shovel.

VENTURA

E—Shell Chemical Corp.

P. O. Box 1451; tel: Miller 8-2551. (Main ofc: New York, N. Y.; Ammonia Dir. ofc: San Francisco, Calif.) F. D. Kuenzly, Plant Mgr. Ammonia & Urea (1956) plant.

VERNON

Ag—Stauffer Chemical Co.

3200 E. 26th St.; tel: ANgeles 2-1141. (Main ofc: San Francisco, Calif.) H. L. Herkelrath, Plant Mgr.

VISALIA

CFPi—Agro Phosphate Co.

P. O. Box 1087. Gordon Greening, Pres.; Standlee Greening, Sec. 20,000 tons.

WASCO

CLPb—Agriform Co., Inc.

P. O. Box 66. (Main ofc: Santa Ana, Calif.) Stanley Phelps, Plant Mgr. 40,000 t. cap.; 200,000 gal. stor.

WATSONVILLE

CF—Boyer Fertilizer Service

1st St. & Van Ness Ave.; tel: 4-9351. H. F. Boyer, Owner; Earl D. Wilson, Plant Mgr. 10,000 tons. 1 mill, 2 tons per hr.; belt conveyor & hopper system.

CF—California Mor-Life, Inc.

202 Walker St.; tel: 2-0434. Tetsuo Arao, Pres.; Jim Etow, Sec.-Treas.; Harry Mayeda, V.P.; Stan Sutherland, Sales Mgr.; P. E. Gumderson, Plant Mgr. 150,000 t. cap.; 18,000 sq. ft. stor. 1 mill; crusher, roller; shaker screens; bucket elevator; batch bins; hopper scale bins; scales; horizontal & vertical screws; mixing bin; valve type bagger; storage bins.

LH—Green-Gro Fertilizer & Supply Co.

1485 Hwy. 1; P. O. Box 381; tel: 2-1031. W. C. Denny & Walter W. Love, Ptnrs. 3,000 t. cap.; 200 t. stor.

WEST COVINA

E—Pearl Phosphate Co.

153 N. Willow Ave.; tel: EDgewood 7-2811. F. J. Pearl, Owner. 6,000 t. cap.; 500 t. stor. 1 mill, 20 t./hr.; Link Belt conveyors; Ford tractor with Davis skip loader; Williams mill with LeRoi natural gas engine; Lane Sly dust collecting system; Dry, grind, calcinate and defluorinate phosphate rock. Mine at Woodruff, Utah.

WHITTIER

CPf—Leffingwell Chemical Co.

10523 Santa Gertrudes Ave.; P. O. Box 191; tel: OXford 7-1716. Frances Ann Black, Pres.; V. G. Ryland, V.P., Treas. & Gen. Mgr.; Wm. B. Black, Sec. & Sales Mgr.; J. D. Brannon, Supt. 8,000 t. cap.; 500 t. stor. 1 mill, 10 t./hr.; stackers; tow motors.

WILLOWS

CF—Glenn Fertilizer Co.

Garden & N. Colusa Sts.; tel: 68. Kent M. Weaver, Jr., & Darden W. Taylor, Ptnrs. 3,000 t. cap.; 8,000 t. stor. 1 mill; complete mechanized equipment.

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
s—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

WILMINGTON

CL—Agriform Co., Inc.
(Main ofc: Santa Ana, Calif.) 30,000 t. cap.; 513,000 gal. stor.

CFP—Kellogg Supply Co.
23924 S. Figueroa St.; tel. NEvada 6-1376. H. Clay Kellogg, Owner; Rowland E. Myers, Sec. & Gen. Mgr. 60,000 t. cap.; 200,000 t. stor. 3 mills, each 20,000 t./yr.; fork lifts; screw conveyors; bucket elevators; drag conveyors; belt conveyors; tractors; trucks; skip loaders; cranes; carry-all. Plant also at Los Angeles, Calif.

E—Pacific Coast Borax Co.—Div. Borax Consolidated, Ltd.
(Main ofc: Los Angeles, Calif.) Borates plant.

WOODLAND

CFHPb—Western Farm Chemical Co.
Kentucky Ave. & Knights Landing Hwy.; P. O. Box 221; tel. 2-4182. H. W. Arrowsmith, Pres., Treas. & Pur. Agt.; Dirck W. Arrowsmith, Sec.; Lyle Scheideman, Plant Mgr. 6,000 t. cap.; 600 t. stor. 1 hammer mill; 1 chain and bar drag conveyor.

YUBA CITY

CFPb—Yuba City Mills
324 A St.; P. O. Box 271. Jerry Harris, Owner, 1,000 tons.

COLORADO

ALAMOSA

CagF—Valley Fertilizer Co.
P. O. Box 540; tel. 1260. Sidney Anderson, Pres.; Roy D. Golston, V.P.; K. M. Lust, Plant Mgr. 7,500 tons. 1 mill, 1 ton; unloading elevator and conveyor; 4 elevators; 4 conveyors; 2 Payloaders; fork lift; plant fertilizer project under scales; hoppers.

COLORADO SPRINGS

S—Heller Greenhouse Laboratories
218 E. Pikes Peak Ave.; tel. MEI-rose 2-9067. Mrs. Mary K. Heller, Managing Owner; John J. Dzurovichin, Plant Mgr. Former capacity 200,000 gal. liq. fert. & 500 tons 15-15-15 soluble paste, but plant currently being expanded with switch to paste blend. 2 specially-designed blenders. Warehouse at Manchester, Mass.

DENVER

C—Agricultural Processing Industries, Inc.
3501 East 46 Ave. (Zone 16.) Bedford W. Bird, Gen. Mgr. 200 tons.

E—Bennett Chemical Co.

53rd & Sherman; P. O. Box 6615; tel. AComa 2-8224. Richard E. Bennett, Pres.; Lyman S. Bennett, Gen. Mgr. Diammonium phosphate (21-53-0): 15,000 t. cap.; 100 t. stor. Flow meters; hopper systems; conveyors; tractor shovels.

CagFPM—Capitol Fertilizer Co.
5800 York St.; P. O. Box 6656, Stockyards Sta.; tel. CHerry 4-8491. (Main ofc: National By-Products, Inc., Des Moines, Iowa). Jerome F. Brim, Mgr.; Bernard Vlieg, Supt. 10,000 t. cap.; 2,500 t. stor. 5 batchers; 2 elevators; 1 ton batch mixer; 2 vibrating screens; bagging unit; 2 conveyors; 2 Payloaders; tow motor.

GRAND JUNCTION

CPb—The C. D. Smith Co.
645 E. 4th Ave.; tel. 3064. B. D. Smith, Pres.; S. T. Smith, V.P.; C. A. Dewey, V.P., Plant Mgr. & Mgr. Pesticides Div.; C. D. Smith, Sec. Treas. 1,000 t. cap.; 400 t. stor. 1 mill; ½ ton batch mixer; Payloader; fork lift; elevators; batching equipment.

GREELEY

CagFPM—Simplot Soilbuilders of Greeley—Div. J. R. Simplot Co.
P. O. Box 520; tel. 2940. (Main ofc: Boise, Idaho; Fertilizer Div. Hdq., Pocatello, Idaho) Wayne Von Trotha, Plant Mgr. 5,000 t. cap. 2,000 t. stor. Payloaders; conveyors.

LONGMONT

Cag—Farm Chemical Co.
1 S. Bowen St.; P. O. Box 697; tel. 1815. Leon E. Williams, Owner; George S. Fleming, Gen. Mgr. 10,000 t. cap.; 1,000 t. stor.

MANZANOLA

CaPbm—Colorado Plant Food Co.
P. O. Box 366 (Rocky Ford); tel. HObart 2-5516. R. M. Pitcher, Owner; Erick T. Hilderbrandt, Sales Mgr. & Mgr. Pesticide Div.; J. E. Caravajal, Plant Mgr. 10,000 t. cap.; 1,500 t. stor. 2 mills, 1 ton each; conveyor system with ammoniation mill; tractor shovel.

MONTE VISTA

CPb—Moloney Seed Co.
Box 151; tel. 153. A. I. Moloney, Owner & Pres.; Emmett A. Moloney, V.P. & Plant Mgr. 1,300 t. cap.; 150 t. stor. 1 mill, 20 t./day; 1 long sack conveyor & 2 portable conveyors.

SWINK

CFPM—Simplot Soilbuilders of Swink—Div. J. R. Simplot Co.
P. O. Box 323; tel. (Rocky Ford) 0284-J3, (La Junta) 1832. (Main ofc: Boise, Idaho; Fert. Div. Hdq. Pocatello, Idaho.) W. R. Burgess (Greeley), Dist. Mgr.; E. L. Schumacher, Plant Mgr.; C. E. Wadleigh, Asst. Plant Mgr. 5,000 t. cap.; 2,000 t. stor. 1 mill, ½ ton.

CONNECTICUT

EAST WINDSOR

C—Apothecaries Hall Co.
(Office: Waterbury, Conn.) Lloyd C. Schlichting, Plant Mgr. 50,000 t. cap.; 30,000 t. stor.

HARTFORD

CaPb—Olds and Whipple, Inc.
Office: 168 State St.; P. O. Drawer 1470; tel. JA 2-9121. Plant at 120 Tolland St., E. Hartford. Merle W. Whipple, Pres.; Ernest J. Brewer, V.P.; F. Herbert Mackay, V.P.; Frank A. Olds, Treas. & Chmn. of Board; Wm. C. Duffy, Sec.; Wallace G. Hastings, Asst. Sec.; Leon Victor Gue, Supt.; William J. Treuting, Mgr. Pesticide Div. 50,000 t. cap.; 20,000 t. stor. 2 mills; hopper systems; conveyors; tractor shovels.

NEW HAVEN

S—The Mamlon Co.
1069 Whalley Ave.; tel. FUlton 7-0529. Anthony B. Longo, Owner &

Gen. Mgr. 150 t. cap.; 50 t. stor. 1 mill. Concentrated water-soluble fertilizers.

NORTH HAVEN

CPb—Woodruff Fertilizer Works, Inc.

Tel: ATwater 8-4572. James R. Rossman, Pres.; Roland A. Payne, Asst. Sec.; George Thody, Plant Mgr. 7,500 t. cap.; 4,000 t. stor. 2 mills, 50 t./day; hopper systems; conveyors; tractor shovels.

PORTLAND

CaPbfm—Rogers & Hubbard Co.

P. O. Box 233; tel. (Middletown) Diamond 6-6641. B. B. Fall, Pres.; E. S. Davis, Jr., V.P. & Treas.; A. F. Kingsbury, Jr., Sec. 18,000 t. cap.; 8,000 t. stor. Conveyors; clam Shell bucket for barge unloading; Hough Payloaders.

STAMFORD

CDPb—The F. A. Bartlett Tree Expert Co.

60 Canal St.; tel. DA 3-1131. Dr. F. A. Bartlett, Board Chmn.; O. W. Spicer, Pres.; G. M. Coddling, Exec. V.P.; W. Heisinger, Sec.-Treas.; R. A. Bartlett, 1st Exec. V.P.; L. F. Strout, Plant Mgr. 500 tons. 1 mill, ½ ton.

WATERBURY

Apothecaries Hall Co.

28 Benedict St.; P. O. Box 790; tel. PLaza 6-5521. Frederic R. Kellogg, Pres.; Edw. R. Jones, V.P., Treas. & Mgr. Ag. Div.; Levi Wilcox, Sec.; Everett D. Marvin, Jr., Asst. Mgr., Ag. Div. Plant at East Windsor, Conn.

SDFPbfm—Oscar F. Warner Landscape Forester

Oscar F. Warner & Harriet S. Warner, Ptnrs. 10-20 t. cap.; 15 t. stor. Tree & lawn specialties.

WEST HAVEN

CaFG—New Haven Rendering Co.

7 Spring St.; P. O. Box 1920 (New Haven 9); tel. WEst 3-5404. (Main ofc: Consolidated Rendering Co., Boston, Mass.) C. O. Duke, Mgr. 10,000 t. cap.; 6,000 t. stor. 2 mills, 25 t./hr.; tractor shovels; belt conveyors from mixers to den & from bagger to trucks or cars.

DELAWARE

GEORGETOWN

EO—Melson Fertilizer Co., Inc.

Pierre Hoge, Chmn. of Board; Harvey Melson, Pres. & Gen. Mgr.; J. F. Bratton, Treas.; Margaret Collins, Sec.; R. W. Hackett, Plant Mgr.

LAUREL

CaFPM—Valliant Fertilizer Co.

Tel: 7511. E. Stephens Valliant, Chmn. Board; Elbert N. Carvel, Pres.; Edwin S. Valliant, Jr., V.P. & Treas.; J. Carlton Hearn, Sec.; Ernest Dickerson, Plant Mgr. 25,000 t. cap.; 10,000 t. stor. 2 mills, 300 t./day; 10 conveyors; clam shell for unloading boats; 4 Hough Payloaders; 2 retractable conveyors for loading trucks; automatic bulk loader; Yale fork lift truck.

MILFORD

CaFGH—Milford Fertilizer Co.

Edwin S. Valliant, Jr., Pres. &

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
 a—ammoniate g—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

Pur. Agent.; Elbert N. Carvel, V.P.; Robert A. Fischer, Sec.-Treas.; Louis Carpenter, Plant Mgr. 10,000 t. cap.; 6,500 t. stor. 2 mills, 40 t./hr.; conveyors; tractors.

SEAFORD

CaFH—Huston Culver Fertilizers, Inc.
 Bradford St.; P. O. Box 89; tel: 512. Dallas D. Culver, Pres.; Geo. H. Culver, V.P. & Treas.; Houston Wilson, Sec.; Anna W. Culver, Asst. Treas.; Albert Culver, Plant Mgr. 10,000 t. cap.; 3,500 t. stor. 1 mill; belt conveyors; shovels; tractors.

CF—Soil Service

New St.; P. O. Box 94; tel: 7054. Ralph Palmer, Owner & Operator. 500 tons. Mixer with conveyor to hoppers for loading spreader truck or bulk trucks.

CF—A. S. Wooley Co., Inc.

S. Pine St.; P. O. Box 419; tel: 7061. Thomas Scott Purse, Pres.; Mrs. Mary J. Eddy, V.P.; Jean L. Purse, Sec.-Treas.; Leonard H. Barkley, Plant Mgr. 5,000 tons. 2 mills; belt conveyors; hoppers; tractor shovels.

SELBYVILLE

EO—Smith-Rowland Co.—Div. Smith-Douglas Co., Inc.
 (Main ofc: Norfolk, Va.) R. E. Hargrove, Plant Mgr.

SMYRNA

CaFHPbm—Warner W. Price Co., Inc.
 P. O. Box 591; tel: 5511. Warner W. Price, Jr., Pres. & Pur. Agt.; Mildred H. Price, V.P.; Harry J. Lower, V.P. & Treas.; James R. Ford, Sec. & Mgr. Pesticide Div.; Courtland H. Gaulke, Plant Mgr. 15,000 t. cap.; 4,000 t. stor. 1 mill, 1 ton; hopper system; 5 belt conveyors; bulk loading stations; 3 tractor shovels.

WILMINGTON

Cag—Eastern States Farmers' Exchange, Inc.
 Marine Terminal (1); tel: 4-3161. (Main ofc: West Springfield, Mass.) W. D. Milsop (W. Springfield), Gen. Mgr.; W. H. Prigmore (W. Springfield), Dir. Purch. & Prod.; J. R. Myers (York, Pa.), Prod. Mgr.; D. O. Conrad, Plant Mgr. 20,000 t. cap.; 7,000 t. stor. 1 mixing unit, 15-20 t./hr.; 1 shipping unit, 30 t./hr.; hopper system; conveyors, tractor shovels; granulator.

DISTRICT OF COLUMBIA

WASHINGTON

F. W. Bolgiano & Co.
 411 New York Ave., N. E.; tel: Lincoln 7-4800. Mrs. Nellie D. Bolgiano, Pres.; Gordon R. Smith, V.P.; C. Blakley Arthur, Treas.; Wilson Disney, Sec. & Mgr. Pest. Div.; W. H. Cockerell, Plant Mgr. Plant at Landover, Md.

FLORIDA

BARTOW

E—Armour Fertilizer Works
 Mulberry Rd.; P. O. Box 150; tel: 2-6311, 2-6321. (Main ofc: Atlanta, Ga.) E. C. Johnson, Plant Mgr.

E—Davison Chemical Co.—Div. W. R. Grace & Co.

P. O. Box 471; tel: 2-1211. (Main ofc: Baltimore, Md.) J. M. Harris, Mgr.

C*—Ideal Fertilizer Co.

P. O. Box 113. Reginald Garrett, Mgr.

E—International Minerals & Chemical Corp.—Phosphate Chemicals Div.

Bonnie Plant; P. O. Box 839; tel: 2-1811. (Main ofc: Chicago, Ill.) William Bellano, Plant Mgr. Sulphuric & Phosphoric Acid, triple superphosphate. 200,000 tons.

E—International Minerals & Chemical Corp.—Phosphate Minerals Div.

(Main ofc: Chicago, Ill.) F. B. Bowen, Mgr. Rock phosphate mines.

E—Swift & Co.

R.F.D. 1, Box 200; tel: 2-5291, 2-5391, 2-5491, 2-8251. (Main ofc: Chicago, Ill.) H. P. Gould, Mgr. Phosphate Mine.

BELLE GLADE

CPm—Hector Supply Co.

Tel: 2281. (Main ofc: Miami, Fla.) M. M. Sabiston, Supt. 2,000 t. cap.; 300 t. stor. 1 mill; belt conveyors; tractor shovel.

CFPfm—Wedgworth's, Inc.

Box 206; tel: 2076. Ruth S. Wedgworth, Pres.; N. T. Taylor, Gen. Mgr. 4,000 tons. 1 Atlanta Utility mill, ½ ton batch; Link-Belt unloading hopper; Link-Belt elevator and drag conveyor chain for bulk materials handling from cars to bins; 1 Hough Payloader.

BREWSTER

E—American Cyanamid Co.—Agricultural Chemicals Div.
 (Main ofc: New York, N. Y.)

CLEARWATER

CPb—Pinellas Growers Assn. Fertilizer Works

Ofc: 625 Grand Central St.; Plant: 624 Pinellas St.; P. O. Box 682; tel: 3-2246. Stephen Chase, Pres.; A.V. Saurman, Sec.-Treas. & Mgr. 10,000 tons. 1 mill, 10 t./hr.; Payloader; conveyors.

COTTONDALE

Aag—Cartledge Fertilizer Co.—Div. Wilson & Toomer Fertilizer Co.

P. O. Box 7. (Main ofc: Jacksonville, Fla.) Raymond Cartledge, Mgr. 50,000 tons.

DADE CITY

C*—Pasco Packing Co.—Fertilizer Div.

J. T. Lykes, Pres.; L. C. Edwards, Jr., H. S. Massey, V.P.; L. M. Hawes, Sec.-Treas.; H. H. Boltin, Prod. Mgr.; H. C. Wheelchel, Plant Mgr.; A. L. Spencer, Pur. Agt.

DR. PHILLIPS

CaP—Minute Maid Groves Corp.—Fertilizer Div.

Tel: 3-1088. (Main ofc: Frostproof, Fla.) N. H. Maring, Supt. 25,000 t. cap.; 5,000 t. stor. 1 mill, 1 ton; hopper system; tractor shovels.

DUNEDIN

C—L. B. Skinner Co., Inc.

379 Monroe St.; P. O. Box 126; tel:

81-3361. Mary E. Skinner, Pres.; F. L. Skinner, Sec.-Treas.; Wallis L. Skinner, Plant Mgr. 300 tons. 1 mill.

DUNNELLON

E—Soil Builders, Inc.

F. O. Hanks, Pres.; C. D. Bevis, V.P.; E. B. Larson, Sec.-Treas.; A. S. Head, Plant Mgr. Soft phosphate with colloidal clay. 20,000 tons.

E—Sun Phosphate Co.

Soft phosphate with colloidal clay. 20,000 tons.

E*—Superior Phosphate Co.

J. H. Roof, Sr., Pres.; R. D. Roof, V.P.; B. E. Roof, Treas.-Sec. Phosphate clay. 20,000 tons.

FT. LAUDERDALE

CaPm—Everglades Fertilizer Co.

2001 W. Broward Blvd.; P. O. Drawer 821; tel: Jackson 2-2851. Jno. B. Dye, Pres.; J. A. Speights, V.P.; John B. Dye, Jr., Treas. & Pur. Agt.; Alfred M. Dye, Sec. & Plant Mgr.; W. J. Maxwell, Supt. 20,000 tons. 2 mills, 1½ & 1 ton; Davidson-Kennedy cluster hopper; truck loading & material handling conveyors; Kraft bag packer; 4 Hough Payloaders; Trojan car scoop.

FT. PIERCE

CaPfm—Davison Chemical Co.—Div. W. R. Grace & Co.

P. O. Drawer 150; tel: 1300. (Main ofc: Baltimore, Md.) A. C. Gordy, Mgr. Bulk loading facilities.

C—Superior Fertilizer & Chemical Co.

(Main ofc: Tampa, Fla.) George F. Marrs, Prod. Mgr. 1 mill, 25 t./hr.; Payloaders.

FROSTPROOF

CaP—Minute Maid Groves Corp.—Fertilizer Div.

5th St.; P. O. Box 427; tel: 3591. E. R. Johnson, Mgr.; N. H. Houston, Supt. 18,000 t. cap.; 3,000 t. stor. 1 mill, ½ ton; hopper system; tractor shovels. Plant also at Dr. Phillips, Fla.

GOULDS

CaLPfm—Southern Florida Fertilizer Co.

(Owned by R. W. Brown & Co., Inc.) U. S. Hwy. 1; P. O. Box 96; tel: (Homestead) 494. Winford W. Brown, Pres.; Genevieve R. Brown, Sec.; R. O. Brown, Supt. 10,000 t. cap.; 200 t. stor. 1 mill, 15 t./hr.; 2 Payloaders; automatic bagging; Union sewing; weighing hopper; automatic dumping for elevator feed.

HAINES CITY

C—Gentile Bros. Co.

Tel: 2221. (Main ofc: Winter Park, Fla.) Ernest Reagan, Supt. 10,000 tons.

CaPbm—Haines City Fertilizer Works

P. O. Box 337; tel: 6-4101. A. C. Mathies, Mgr. 10,000 tons. 1 mill, 1 ton; complete bulk handling system from mixer to groves; conveyors; tractor shovels.

Ca—Polk County Fertilizer Co.

Dixie Hwy.; ACL Yards; P. O. Box 366; tel: 4201; 6-1891. L. B. Angel, Pres.; John L. Olson, Sec.-Treas.; V. J. Dillistone, Supt. 50,000 t. cap.;

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
s—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

5,000 t. stor. 2 mills, 30,000 & 20,000 t./yr.; conveyors; tractor shovels; automatic scales; mixing equipment.

HAVANA

CP—The Planters Exchange, Inc.
P. O. Box 858; tel: 2 & 19. W. P. Woodberry, Pres.; B. L. Gregory, V.P.; T. M. Gregory, V.P.; W. L. Williams, Sec.-Treas. & Gen. Mgr.; C. W. May, Supt. 15,000 tons. 1 mill.

HIGH SPRINGS

E*—Loncala Phosphate Co.
Tel: 110. Sam Kelly, Pres.; Charles Savage, V.P.; Betty C. Means, Sec.-Treas.; Barney Floyd, Supt.; Davis H. Parker, Plant Mgr. Colloidal phosphate producers. 15,000 tons.

HOMESTEAD

CaPbm—Florida East Coast Fertilizer Co.
P. O. Box 455, 452 S. Flagler St.; tel: 16 & 17. G. Walter Moody, Pres.; A. D. Fogle, Sec.-Treas.; Henry R. Pridgen, Gen. Mgr.; John M. Frederick, Plant Mgr.; Howard C. Bardsley, Mgr. Pesticide Div. 20,000 tons. 2 mills, 1 t. each; Davidson-Kennedy weigh-batch system; belt conveyors of own design; Inglett & Corley sacking system.

JACKSONVILLE

A—Armour Fertilizer Works
8th & Talleyrand Ave.; P. O. Box 588; tel: 4-0541, 3-0762. (Main ofc: Atlanta, Ga.) B. W. Alphin, Div. Mgr.

CaPfm—Davison Chemical Co.—Div. W. R. Grace & Co.
1424 Barnett Bldg.; 112 W. Adams St.; P. O. Box 1114; tel: 3-8601. (Main ofc: Baltimore, Md.) R. L. Johns, Mgr.

Ca—International Minerals & Chemical Corp.
Buffalo Ave. at 54th St.; P. O. Box 3323, Sta. F; tel: ELgin 5-8515. (Main ofc: Chicago, Ill.) K. B. Kelam, Supt.

Ca—Trueman Fertilizer Co.
87 Broad St. Viaduct; P. O. Box 1175. Ray B. Trueman, Pres.; J. J. McGrath, V.P.; Hoyt Bragdon, V.P. & Treas.; Henry J. Cocks, Sec.; W. R. Royster, Plant Mgr. 50,000 tons. 2 mills; hopper system.

C—Virginia Carolina Chemical Corp.
Tel: 3-0717. (Main ofc: Richmond, Va.)

A—Wilson & Toomer Fertilizer Co.
P. O. Box 4459. Wallace B. Hicks, Pres.; Frank Taylor, Jr., B. D. Barber, M. C. VanHorn, V.P.; George D. Hore, Sec.; W. M. Lane, Asst. Treas.; E. E. Hore, Asst. Sec.-Treas.; W. A. Stone, Plant Mgr.; Fred D. Coffee, V.P. & Prod. Mgr. 125,000 tons. Plants also at: Cottondale, Port Everglades & Tampa, Fla.

LAKE ALFRED

CaFPbm—Growers Fertilizer Cooperative
Buena Vista Dr.; P. O. Box 1328; tel: (Winter Haven) 3698, 3-1932. B. T. Reynolds, Pres. & Treas.; Norman A. Street, V.P.; R. L. Brumbaugh, Asst. Treas.; Paul N. Simmons, Sec. & Gen. Mgr.; B. F. E. Shores, Supt. 40,000 t. cap.; 12,000 t. stor. 1 mill, 2 tons; batching hoppers; bulk loading hoppers; bulk

weighing scales; complete conveyor system for handling in and out of plant; lift trucks; Payloaders.

LAKE WALES

CaPbm—Ridge Fertilizer Co.
N. Scenic Hwy.; P. O. Box 486; tel: 2-3091. M. C. Dopler, Pres.; H. F. Bullard, V.P.; P. J. Gum, Sec.-Treas. & Mgr.; H. B. Hinton, Supt. 20,000 tons. 3 Payloaders; conveying belts; hopper bulk loading.

LAKELAND

C—Florida Favorite Fertilizer, Inc.
W. Olive St.; P. O. Box 912; tel: MUltual 2-1291. W. H. Stuart, Pres.; J. K. Stuart, V.P.; M. A. Cook, Sec.-Treas.; E. F. Murray, Mgr.; J. E. Palmer, Plant Supt. 45,000 t. cap.; 5,000 t. stor. 2 mills, 1 & 1½ ton; 2 cluster hoppers, 6 & 9 bin; overhead conveyor; 3 portable conveyors; 7 Hough Payloaders; 2 fork lifts.

LEESBURG

Ca—Foremost Fertilizer Co.
P. O. Box 358; tel: 666, 667. Bryon E. Herlong, Pres.; R. Parks Williams, V.P.; Walter Manly, Sec.-Treas.; Norwood A. Lockett, Gen. Mgr.; W. J. Belding, Jr., Plant Mgr. 30,000 t. cap.; 100 t. stor. 1 mill, 1½ tons; conveyor belts; for unloading materials from car to bin also from hoppers to mixer; hopper system—4 hoppers with 14 compartments; Payloaders; fork lift; automatic bagging.

O—M-16 Products, Inc.
1101 N. 14th St.; P. O. Box 450; tel: 525. C. J. Rollo, Pres.; J. G. White, V.P.; G. L. McComb, Sec.-Treas. & Gen. Mgr. 10,000 t. cap.; 1,000 t. stor. Conventional mixing & bagging set-up. Compost fertilizers.

MIAMI

CaHPm—Hector Supply Co.
Ofc: 235 S. Miami Ave.; Plant 1801 N. W. Miami Ct.; P. O. Box 1311; tel: 2-0541. R. C. Hector, Pres.; Adrian Jacobs, V.P.; C. E. Reger, V.P. & Sec.-Treas.; W. D. DeHass, Supt. 30,000 t. cap.; 5,000 t. stor. 2 mills, 50 & 15 t./hr.; small cluster hopper system; automatic scales; tractor shovels; 2 unloading conveyors; 1 loading belt conveyor; 2 shuttle belt basing conveyors. Plant also at Belle Glade, Fla.

SPb10-E.M.* Plant Food**
3255 W. Flagler St.; P. O. Box 366, Riverside Sta.; tel: HI 0593. Mrs. Zana Deatrick, Owner.

MOUNT DORA

CaFHPb—Citrus Culture Corp.
132 5th Ave.; P. O. Box 67; tel: 2-3461. J. E. Fortner, Pres. & Gen. Mgr.; Geo. J. White, Sec.-Treas.; J. A. Sligh, Plant Mgr.; W. Donald Cokling & Edward C. Mitchell, Mgrs. Pest. Div.; 30,000 t. cap.; 2,000 t. stor. 1 mill, 25 t./hr.; 10 cluster hopper system; conveyor belts; unloading elevator with 100-ft. shuttle belt conveyor for filling storage bins; 3 Payloaders.

MULBERRY

Ca—International Minerals & Chemical Corp.
Ofc: P. O. Box 2567; tel: 2481, 2491. Plant: P. O. Box 547; tel: 3251. (Main ofc: Chicago, Ill.) E. Meade

Wilson, Area Mgr.; D. N. Barksdale, Dist. Mgr.; G. T. Hackney, Supt.

E—F. S. Royster Guano Co.

P. O. Box 548. (Main ofc: Norfolk, Va.) L. D. Yates, Mgr. Sulphuric & phosphoric acid, triple superphosphate.

NICHOLS

AE—Virginia-Carolina Chemical Corp.

Tel: (Mulberry) 3201. (Main ofc: Richmond, Va.) Factory, concentrated superphosphate plant; phosphate rock mines.

OAKLAND

CFPb—South Lake Fertilizer Works
Tel: (Winter Garden) 61, 91. Dan L. McKinnon, Pres.; Mrs. J. E. Hennes, V.P.; H. C. Tilden, Sec.; George Beck, Plant Mgr.; W. S. Arrington, Prod. Mgr. & Mgr. Pesticide Div. 10,000 tons. 1 mill, 10 tons per hr.

OCALA

CFPfm—Marico, Inc.
N. Osceola St.; P. O. Box 494; tel: MArion 2-4143. James J. Taylor, Pres.; O. C. Branch, Sr., V.P.; L. F. Branan, Sec.-Treas.; O. C. Branch, Jr., Supt. 18,000 t. cap.; 600 t. stor. 1 mill.

ORLANDO

CaPbm—Fosgate Citrus Concentrate Cooperative—Fertilizer Div.
Box 7127, College Park Sta.; tel: (Orlando) 2-0781, (Winter Park) 25-2701. Abe Meer, Mgr. Fert. & Pesticide Depts., Pur. Agt.; Harris Heath, Supt. 20,000 tons. 1 mill, 1 ton; car loaders, Payloaders; hopper system; belt loading equipment; bulk loading.

Ca—Howard Fertilizer Co.
Robert M. & Julian Howard, Owners. 25,000 tons. 1 mill; hopper system; conveyors; bagging equipment; mixing mill; tractor shovels.

E*Howard Phosphate Co.

S. W. & M. C. Howard, Ptnrs.; W. E. Marlow, Plant Mgr. 10,000 tons. Colloidal phosphate mining.

CaFPfm—Walker Fertilizer Co.
2825 N. Orange Blossom Trail; tel: 5-5591. E. B. Hunt, Pres.; J. W. Patrick, V.P. & Mgr. Pest. Div.; R. L. Staples (Mrs. Herbert H. Staples), Sec.-Treas.; C. D. Walker, Chmn. of Board; R. T. Williamson, Plant Mgr. 50,000 tons. 1 mill, 1 ton; hopper system; conveyors; tractor shovels.

OVIEDO

Ca—Wheeler Fertilizer Co.
Box 236; tel: 2511. B. F. Wheeler, Jr., Pres.; Geo. L. Wheeler, V.P.; J. W. Evans, Sec.-Treas.; A. A. Myers, Gen. Mgr.; W. H. Martin, Asst. Sec.-Treas.; J. C. Coe, Supt. 25,000 tons. 1 mill; 1 ton; hoppers; conveyors; Payloaders.

PACE

Eg—Escambia Bay Chemical Corp.
P. O. Box 467, Pensacola, Fla.; tel: (Milton) 2293. M. A. Abernethy, Pres.; D. J. Stark, Plant Mgr. 70,000 t. cap. ammonia; 50-75,000 t. cap. ammonium nitrate; 6,000 t. stor. ammonia.

PAHOKEE

CPfm—Glades Chemical Co.
1002 E. Main St.; P. O. Box 817; tel:

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
a—ammoniate **g**—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

606. Wm. S. Plumer, Pres. & Gen. Mgr.; Howard C. Fisher, V.P.; Howard K. Morgan, Sec.-Treas.; T. E. Pennington, Plant Supt. 10,000 tons. 1 mill, 1 ton; Davidson-Kennedy 9-5 ton hopper system; Davidson-Kennedy 6-500 lb. midget hopper system.

PALMETTO

CaPbm—Producers Supply, Inc.
 11th Ave. — S.A.L. Ry.; P. O. Box 185; tel: 2-9631. J. E. B. Asbell, Pres.; Mrs. J. E. B. Asbell, Sec.; Earl R. Frierson, V.P. & Treas.; Don C. Cofer, Supt. 10,000 t. cap.; 700 t. stor. 1 mill; 1 ton mixer; 2 tractor shovels; 1 car loader; sewing machine; automatic weighing machinery; air valve control of hoppers, mixer, etc.

PENSACOLA

A—The American Agricultural Chemical Co.
 Box 1671; tel: (Sales) 5057 (Works) 4251. (Main ofc: New York, N. Y.) T. T. Gully, Mgr.; O. F. Cordon, Supt.

Ca—International Minerals & Chemical Corp.
 P. O. Box 626; tel: HEmlock 2-6471. (Main ofc: Chicago, Ill.) R. D. Dark, Supt.

C—Merchants Fertilizer — Phosphate Co. of Pensacola, Inc.
 N. Palafox St.; P. O. Box 1306; tel: HEmlock 2-4107. M. J. Clement, Pres. & Gen. Mgr.; M. J. Clement, III, V.P. & Asst. Gen. Mgr.; M. C. Brown, Sec.-Treas. & Mgr.; M. T. Gonzalez, Supt. 40,000 tons.

C—The Southern Cotton Oil Co.
 P. O. Box 1827; tel: 2114, L.D. 3. (Main ofc: New Orleans, La.; Dist. ofc: Cullman, Ala.) J. T. Murphy, Mgr.

PIERCE

A—The American Agricultural Chemical Co.
 Tel: (Mulberry) 2621. (Main ofc: New York, N. Y.) W. A. Lyerly, Jr., Mgr.; A. K. Wood, Supt.

E—The American Agricultural Chemical Co.
 Tel: (Mulberry) 2621. (Main ofc: New York, N. Y.) F. R. Bergquist, Mgr.; J. S. Gruel, Supt. Phosphate Rock Mines; E. N. Taylor, Supt. Phosphorus Plant.

E*—Pierce Phosphorus
 Phosphorus Plant only. F. E. Maurer, Supt.

PLANT CITY

E—Coronet Phosphate Co.—Div. Smith-Douglass Co., Inc.
 (Main ofc: Norfolk, Va.) R. M. Wilbur, Gen. Mgr.; W. H. Taylor, Gen. Supt. Phosphate rock mining operation and defluorinating plant.

CPbm—Alvin H. Hinson
 S. Collins St.; P. O. Box 868; tel: 3-4181. A. H. Hinson, Owner, 5-000 t. cap.; 5,000 t. stor. 1 Atlanta Utility mill. ½ t., 60 t./day; Payloader.

Ca—Shore Fertilizer Co.
 Box 469; tel: 3-0061. S. D. Shore, Mgr. 10,000 tons.

PLYMOUTH

CaFPbm—Plymouth Fertilizer Works
 Tel: (Apopka) TU 6-1111. R. T. Carleton, Sec. & Mgr.; Dean W.

Thomas, Plant Supt.; E. L. Matthews, Prod. Mgr.; A. B. Ashley, Mgr. Pesticide Div. 15,000 t. cap.; 1,000 t. stor. 1 mill; 150 t./day; belt conveyor for making base; belt conveyor for bulk loading; 3 Payloaders.

ST. PETERSBURG

SL—Chatelier Laboratories
 4938 16th St., N.; P. O. Box 119, Sta. A (6). Dr. Paul Chatelier, Owner; Mary K. Chatelier, Sec.-Treas. Starter solutions; special formulas.

CH—Chatelier Plant Food
 5763 62nd St., N.; P. O. Box 146, Sta. A; tel: 42-6131, 41-1555. Dr. Paul A. Chatelier, Plant Mgr. 12,000 tons soluble plant food (dry form); 10 tons storage. Pulverizers; grinders; pebble mill; 2 mixers; hopper; conveyor.

SANFORD

C—Chase & Co.
 200 Oak Ave.; P. O. Box 291; tel: 1900. Randall Chase, Pres.; S. O. Chase, Jr., V.P.; Eric Nordgren, Supt. 20,000 t. cap.; 4,000 t. stor. 2 mills, 100 t./day; Payloaders.

SEBRING

CFH*—Highlands Fertilizer Co.
 W. W. Harshman, Pres.; F. M. Schumacher, Sec.-Treas.; R. S. Hartless, Plant Supt. 10,000 tons.

TAMPA

CaPbm—The Gulf Fertilizer Co.
 1604 36th St.; P. O. Box 2721; tel: 4-2146. L. P. Woods, Chmn. of Board; F. J. Woods, Pres. & Treas.; Mrs. L. R. Woods, V.P.; W. H. Anderson, Sec.; R. G. Alfred, Supt.; R. R. Reed, Mgr. Pesticide Div. 60,000 t. cap.; 7,000 t. stor.; 3 mills, 1½ & 1 ton; 1 hopper system including 4 belt conveyors; Payloaders.

CPbm—Lyons Fertilizer Co.
 34th St. & 4th Ave.; P. O. Box 310; tel: 4-3101. W. L. Waring, Jr., Pres.; J. C. Wolfe, V.P. & Sec.; W. F. McLane, V.P. & Treas.; E. J. Charette, Asst. to Pres.; P. W. Pervoost, Asst. Treas.; V. E. Bourland, Supt. 55,000 tons. 2 mills, 30 t./hr.; hopper system; overhead conveyor; 7 Payloaders; 3 fork lifts.

SCL—Nutri-Sol Chemical Co.
 4508 W. Osborne; P. O. Box 10054 (9); tel: 72-2181. Rex D. McDill, Owner. 500 t. cap. soluble dry & liquid mixes; 200 t. stor. 2 hammer mills, 2 mixers; conveyors.

CaPbm—Peninsular Fertilizer Works —Div. Wilson & Toomer Fertilizer Co.
 Hillsborough at 54th St.; P. O. Box 11308, Produce Sta. (10); tel: 3-1135. (Main ofc: Jacksonville, Fla.) Glenn H. Lucas, Gen. Mgr.; E. V. Gunn, Plant Supt.; M. C. Van Horn, Mgr. Pest. Div. 70,000 t. cap.; 20,000 t. stor. 2 mills, 1½ tons.

CaPfm—Superior Fertilizer & Chemical Co.
 4701 E. Broadway; P. O. Box 1021; tel: 4-4131. G. D. Sloan, Pres. & Treas.; Tom B. Swann, V.P.; D. A. Hunt, V.P.; R. A. Roane, Sec.; Aleen Benton, Asst. Sec.; W. R. Hancock, Gen. Mgr.; C. R. Stearns, Mgr. Pest. Div.; 1 mill, 25 t./hr.; hopper system; conveyors; tractor shovels; Payloaders; bulk loading equipment.

E—U. S. Phosphoric Products—Div. Tennessee Corp.
 P. O. Box 3269; (1); tel: 4-3161. (Main ofc: New York, N. Y.) L. C. Oakley, Jr., Gen. Mgr.; J. K. Sparkman, Sales Mgr. 500,000 tons triple superphosphate, 150,000 tons superphosphate.

CaFPm—West Coast Fertilizer Co.
 1601 34th St.; P. O. Box 1094; tel: 4-3116. C. F. Daly, Pres.; O. H. Maxwell & G. L. Reeves, V.P.; E. A. Fripp, Sec.-Treas.; H. F. Sweet, Plant Mgr. 50,000 t. cap.; 5,000 t. stor. 2 mills, 1½ tons each; belt conveyors; Payloaders.

WAVERLY

CaFPf—Waverly Fertilizer Works
 Tel: 2687. W. C. Pedersen, Pres.; A. E. Walker, V.P.; Charles D. Kime, Jr., Mgr. 12,000 t. cap.; 50 t. stor. 1 mill, 10 tons; conveyors; tractor shovels.

WINTER GARDEN

Ca—Diamond R. Fertilizer Co.
 W. Plant St. at City Limits; Box 132; tel: 522, 580. L. F. Roper, Pres.; B. E. Roper, V.P.; W. F. Roper, Sec.-Treas.; Geo. M. Barley, Gen. Mgr.; Billy Bufkin, Supt. 18,000 t. cap.; 2,500 t. stor. 1 mill, 15 t./hr.; Payloaders; bulk conveyor system.

WINTER HAVEN

C—Swift & Co.—Plant Food Div.
 Box 1272; tel: 2-0042. (Main ofc: Chicago, Ill.) J. W. Whitaker, Mgr.

WINTER PARK

Gentile Bros. Co.
 P. O. Box 275. Victor Gentile, Pres.; Leonard Gentile, Sec.-Treas.; Leonard Gentile, V.P. Plant at Haines City, Fla.

GEORGIA

ADEL

CaPm—The Cotton Producers Assn.
 P. O. Box 269; tel: 4771. (Main ofc: Atlanta, Ga.) J. C. Carr, Supt. 15,000 t. cap.; 9,000 t. stor. 1 mill; hopper system; conveyors; tractor shovels.

ALBANY

CF*Albany Warehouse Co.
 Box 163. J. P. Champion, Pres. & Pur. Agent; R. E. Champion, V.P. & Treas.; J. P. Champion, Jr. V.P., Pur. Agt. & Gen. Mgr. 20,000 tons.

A—Armour Fertilizer Works
 Old Leesburg Rd.; P. O. Box 648; tel: HEmlock 2-6295 & 2-6296. (Main ofc: Atlanta, Ga.) W. A. Higginbotham, Jr., Div. Mgr.

B—Swift & Co.—Plant Food Div.
 P. O. Box 371; tel: HEmlock 2-2328 & 2-2329. (Main ofc: Chicago, Ill.) J. E. Elder, Mgr.

C—Virginia-Carolina Chemical Corp.
 Tel: HEmlock 2-2396; factory tel: HEmlock 2-6561. (Main ofc: Richmond, Va.)

AMERICUS

CFPbm—Americus Oil Co.
 902 W. Church St.; Box 376; tel: 2731. H. E. McMath, Pres. & Pur. Agt.; G. Riley McMath, V.P.; Howard Bankston, Sec.-Treas.; W. Heyward Smith, Asst. Sec.-Treas.; C. L. Belcher, Supt. 10,000 t. cap.; 20,000 t. stor. Payloaders.

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
s—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

Ba—International Minerals & Chemical Corp.
1611 Oak Ave.; P. O. Box 407; tel: 3121. (Main ofc: Chicago, Ill.) F. L. Butler, Supt.

ARLINGTON

CF—Arlington Manufacturing Co.
Box 158; tel: 102. C. M. Cowart, Pres. & Owner; James W. Tindol, Plant Mgr. 1,000 tons.

CD—Arlington Peanut & Fertilizer Co.
Tel: 165, 51. G. C. Davis, Ptnr. & Mgr.; D. H. Morris, III, Ptnr.; W. H. Morris, Ptnr.; A. H. Skipper, Jr., Ptnr.; E. H. Kinsler, Supt. 3,000 t. cap.; 1,000 t. stor. Mixing facilities only.

ATHENS

C—Hulme Fertilizer & Warehouse Co.
G. H. Hulme, Pres. & Mgr.; W. L. Malcom, Plant Supt. 3,000 tons.

CF—Rowe Warehouse & Fertilizer Co.
Ofc: Oneta St.; Plant: Whitehall Rd.; P. O. Box 1107; tel: Liberty 6-1256. Malcolm A. Rowe, Ptnr.; A. M. Doolittle, Mgr.; H. Grady Parr, Supt. 15,000 t. cap.; 6,000 t. stor. 2 mills, 30 tons per hr.; 4 tractors; conveyors.

A—F. S. Royster Guano Co.
Winterville Rd.; Box 872. (Main ofc: Norfolk, Va.) C. P. Belding, Mgr.

ATLANTA

A. D. Adair & McCarty Bros., Inc.
104 Poplar St.; P. O. Box 1596 (1); tel: WALnut 2246. A. D. Adair, Pres. & Treas.; A. D. Adair, Jr., V.P. & Gen. Mgr. Plants at East Point, Ga.; Chattanooga and Gray, Tenn.

Armour Fertilizer Works
General Offices: 350 Hurt Bldg.; P. O. Box 1685 (1); tel: WALnut 2641. W. E. Shelburne, Pres.; H. V. Miller, V.P.; R. White, Gen. Supt.; J. C. Watt, Dir. of Pur.; I. J. Fields, Sec.; V. J. Hair, Treas. Plants at: Birmingham & Montgomery, Ala.; Bartow & Jacksonville, Fla.; Albany, Atlanta, Augusta & Columbus, Ga.; Chicago Heights & E. St. Louis, Ill.; Jeffersonville, Ind.; Waterloo, Iowa; New Orleans, La.; Presque Isle, Me.; Baltimore, Md.; Winona, Minn.; N. Kansas City, Mo.; Cartaret, N. J.; Greensboro & Navassa, N. C.; Cincinnati & Sandusky, Ohio; Columbia, S. C.; Memphis & Nashville, Tenn.; Dallas & Houston, Tex.; Norfolk, Va.; San Juan, P. R.; Havana & Matanzas, Cuba.

A—Armour Fertilizer Works
Monroe Dr., N.E.; P. O. Box 1685 (1); tel: ELgin 3691. (Main ofc: 350 Hurt Bldg.) J. G. Reames, Div. Mgr.

C—Atlanta Chemical Co.
Huff Rd., N.W.; P. O. Box 965 (1); tel: SYcamore 4-4453. W. B. Burns, Pres.; Mrs. T. G. Chastain, V.P.; W. B. Burns, Treas.; D. J. Ray, Sec.; P. H. Ginn, Plant Mgr. 20,000 tons.

The Cotton Producers Assn.
308½ Ivy St., N.E.; P. O. Box 2210 (1); tel: MURray 8-5957. Main ofc: S. S. Johnson (Rome, Ga.) Pres.; Warren P. Sewell, V.P.; C. B. Funderburk, Treas.; D. W. Brooks, Sec. & Gen. Mgr.; J. E. Nunnally, Dir. Plant Food Service. Plants at Adel, Carrollton, Cordele & Savannah, Ga. 85,000 tons gross capacity.

C—F. S. Royster Guano Co.
Piedmont Rd., N.E.; P. O. Box 926. (Main ofc: Norfolk, Va.) J. E. Moss, Supt.

B—Swift & Co.—Plant Food Div.
Marietta Rd., N.W.; tel: SYcamore 4-3306. (Main ofc: Chicago, Ill.) A. L. Wiley, Mgr.

C—Virginia-Carolina Chemical Corp.
Tel: EVERgreen 2543 & 2544; factory tel: DEarborn 1447. (Main ofc: Richmond, Va.)

AUGUSTA

C—Armour Fertilizer Works
1012 Glass Factory Ave.; P. O. Box 338; tel: 2-3526, 2-3527. (Main ofc: Atlanta, Ga.) W. G. Neuhaus, Div. Mgr.

CaPb—Augusta Fertilizer Co.
500 Gwinnett St.; P. O. Box 760; tel: 2-6042. W. W. Doughty, Pres.; C. A. DeBeaugrine, V.P. & Treas.; M. M. Smith, Sec.; C. A. Eckhoff, Supt. 10,000 t. cap.; 4,000 t. stor. 1 mill, 150 t./day; 2 Payloaders.

BaPm—Etheredge Guano Co., Inc.
753 Reynolds St.; tel: 2-6288. J. Lee Etheredge, Pres.; J. Lee Etheredge, Jr., V.P.; P. L. Etheredge, Sec. Treas., Mgr. & Pur. Agt.; H. P. Osborne, Supt.; G. M. Mason, Plant Mgr. 20,000 t. cap.; (500 t./day) 12,000 t. stor.; hopper system consisting of 8 Inglett & Corley bins; bagged material conveyors; Payloaders; drag line for cutting acid den; rock grinding facilities; basing mill, 35 t./hr.; 2 bagging mills, 25 & 45 t./hr.

Ba—International Minerals & Chemical Corp.
Molly Pond Rd.; P. O. Box 930; tel: 4-5451. (Main ofc: Chicago, Ill.) C. H. Flint, Supt.

A—Virginia-Carolina Chemical Corp.
Tel: 2-5928. (Main ofc: Richmond, Va.)

BARTOW

CE—Bryant's Inc.
Tel: 58. Fred C. Evans, Pres.; J. B. Evans, Sec.; John B. Greenway, Supt. 2,500 t. cap.; 1,600 t. stor. 1 mill, 10 t./hr.

BLACKSHEAR

CF—The Blackshear Mfg. Co.
L. J. Allen, Pres.; J. H. Donaldson, & R. D. Thomas, V.P.; Warren Lott, Sec. Treas.; Geo. D. Brantley, Asst. Sec. Treas.; M. E. Dowling, Plant Mgr. 25,000 tons. 2 mills; belt conveyors; hopper systems.

BUTLER

C—J. T. Cochran Estate
Tel: 86. R. T. Cochran, Mgr. 2,500 t. cap.; 600 t. stor. 1 mill, ¼ ton.

CAIRO

CaFP—Graco Fertilizer Co.
P. O. Box 89; tel: 2-1602. C. T. Helm, Pres.; H. T. Leggett, V.P.; R. E. Johnson, Sec. Treas. & Gen. Mgr.; Groover Godwin, Supt. 7,500 t. cap.; 4,500 t. stor. 1 ton mixer; hopper; conveyors; tractors.

CAMILLA

CF—Camilla Cotton Oil Co.
George M. Perry, Pres.; W. Delma

Givens, Plant Mgr. 6,000 tons.

CF—The W. F. Cullens Fertilizer Co.
Scott St.; Drawer 192; tel: 4221. W. F. Cullens, Owner; P. C. Cullens, Gen. Mgr.; B. H. Hurst, Supt. 10,000 t. cap.; 5,000 t. stor. 1 mixing unit, 30 tons per hr.; belt conveyors; hoppers.

CARROLLTON

BaPm—The Cotton Producers Assn.
P. O. Box 382; tel: TERRace 2-2111. (Main ofc: Atlanta, Ga.) J. R. Hollingsworth, Supt. 25,000 t. cap.; 14,000 t. stor. 2 mills; hoppers; conveyors; tractor shovels.

CARTERSVILLE

CF—The Southern Cotton Oil Co.
P. O. Box 910; tel: 109. (Main ofc: New Orleans, La.; Dist. ofc: Macon, Ga.) Sam McGowan, Mgr.

CEDARTOWN

C—Tennessee Corp.
(Main ofc: New York, N. Y.)

COLQUITT

CaFP—Farmers Fertilizer & Milling Co.
Fourth St.; tel: 3520. W. H. Rawls, Pres. & Mgr. Pest. Div.; T. W. Rentz, V.P.; Mrs. Hazel Rawls, Sec. Treas.; C. C. Jones, Supt. 10,000 t. cap.; 3,500 t. stor. 1 mill, 1¼ tons; belt conveyor; portable conveyor; 2 Hough HA Payloaders.

COLUMBUS

A—Armour Fertilizer Works
Brennan Rd.; P. O. Box 631; tel: 3-1826. (Main ofc: Atlanta, Ga.) F. B. Mainor, Div. Mgr.

Ca—W. C. Bradley Co.
Front Ave.; P. O. Box 140; tel: 7-4385, 3-8524. D. A. Turner, Chmn. Wm. B. Turner, Pres.; L. P. Corn, 1st V.P.; T. C. Perry, F. H. Turner & M. J. Starling, V.P.; P. H. Burrus, Sec. Treas. & Pur. Agt.; J. R. Thomas, Supt. 10,000 t. cap.; 6,500 t. stor. 2 mills, 1 ton each; conveyor; tractor.

COMER

CaP—Whitehead & Gholston
Tel: 8302. H. J. Whitehead, Active Ptnr.; J. K. Gholston, Inactive Ptnr.; S. P. David, Plant Mgr. 4,000 t. cap.; 3,000 t. stor. 1 mill, 30 t./hr.; 2 Payloaders.

COMMERCE

CPb—Commerce Fertilizer Co.
Broad St.; P. O. Box 111; tel: 3-7272; plant tel: 3-4311. J. M. Shepherd, Pres.; V. L. Davis, V.P.; Mrs. T. A. Minish, Sec. Treas.; J. B. Williams, V.P. & Gen. Mgr.; W. B. Wilson, Supt. 3,500 tons.

CONCORD

CF—R. F. Strickland Co.
Tel: GYpsy 5-2361. R. H. Strickland, Sr., Pres. & Pur. Agt.; G. M. Strickland, Sr., V.P.; R. H. Strickland, Jr., Sec. Treas.; Geo. M. Strickland, Jr., Plant Mgr. 2,000 tons 1 mixer.

CORDELE

BaPm—The Cotton Producers Assn.
P. O. Box 411; tel: 82. (Main ofc: Atlanta, Ga.) G. A. Burson, Plant Mgr.; Harold Green, Supt.; H. D. Purswell, Mgr. Pest. Div. 25,000 t. cap.; 16,000 t. stor. 2 mills; hopper systems; conveyors; tractor shovels.

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
a—ammoniate **g**—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

C—The Southern Cotton Oil Co.
 (Cordele plant #1.) P. O. Box 416; tel: 1078. (Main ofc: New Orleans, La.; dist. ofc: Macon Ga.) E. O. Leddon, Mgr.

COVINGTON

CaF—Fowler Fertilizer Co.
 Tel: 2695. R. R. Fowler, Pres; John R. Chestnut, Supt. 10,000 tons. 1 mill, ½ ton.

CUTHBERT

C—Cuthbert Gin Co.
 P. O. Box 272; tel: 146. P. M. Reid, Pres.; W. W. Broach, V.P. & Gen. Mgr.; Sara Pearce, Sec.-Treas.; E. B. Cox, Plant Mgr. 5,000 tons.

DALTON

CF—J. W. Looper & Swann
 401 McCamy St.; tel: 302. J. W. Looper, R. P. Swann & L. L. Swann, Ptnrs.; H. J. Longley, Plant Mgr. 3,000 t. cap.; 2,000 t. stor. 1 mill.

DAWSON

C—Dawson Compress & Storage Co.
 P. O. Box 510; tel: 44. T. B. Raines, Pres.; Ernest Baldwin, Sec.-Treas. & Gen. Mgr.; Frank Orr, Supt. 5,000 tons. 1 mill.

CF—The Southern Cotton Oil Co.
 P. O. Box 429; tel: 49, L.D. 448. (Main ofc: New Orleans, La.; dist. ofc: Macon, Ga.) F. A. Graham, Mgr.

CF—Stevens Industries, Inc.
 Tel: 390. M. E. Williams, Pres.; R. G. Dozier, Jr., E. J. Young & C. M. Cruikshank, Exec. V.P.'s. 30,000 t. cap.; 12,000 t. stor. 1 mixing plant; 2 base storage houses; belt conveyors; Payloaders.

DOERUN

CFH—Shepard Fertilizer Co.
 Tel: 5-2160. (Main ofc: Moultrie, Ga.) A. H. McGraw, Prod. Mgr.; W. E. Shepard, Pur. Agt. & Co-Mgr.; Louis Shepard, Co-Mgr. 10-15,000 tons. 1 mill, 25 tons per hr.; conveyor belt for basing; mechanical shovels.

CPb—Toney Bros.
 P. O. Box 38; tel: 5-2831. J. W. Toney & B. B. Toney, Ptnrs.; George Daniels, Plant Mgr. 10,000-15,000 tons. Hopper system; belt conveyors.

DOUGLAS

CaFP—The C. O. Smith Guano Co.
 Tel: 611. (Main ofc: Moultrie, Ga.) R. C. Plymale, Plant Mgr.; Bob Taylor, Supt. 12,000 tons. 2 mills; complete belt conveyor system; Inglett hopper batching system; Hough tractor shovels.

DUBLIN

C—Carroll Fertilizer Co.
 Madison St.; P. O. Box 475; tel: 474. Cecil E. Carroll, Owner & Pur. Agt.; Mendel D. Johnson, Supt. 3,000 t. cap.; 2,000 t. stor. 1 mill, ½ ton; 2 elevators; 150 feet of belt conveyors; Payloaders; Atlanta Utility mixer.

CaFPbm—Lovett & Brinson, Inc.
 601 E. Jackson St.; tel: 108, 373. W. H. Lovett, Pres.; W. E. Lovett, V.P.; W. W. Brinson, Sec.-Treas. & Pur. Agt.; A. H. Womack, Plant Mgr. 10,000 t. cap.; 5,000 t. stor. 1 mill, 1 ton; hopper system; conveyors; 2 Payloaders.

CaFPbm—Roche Manufacturing Co.
 Jackson St.; tel: 47. Alvis Payne, Plant Mgr. 3,000 t. cap.; 1,000 t. stor. 1 mill, 15 t./hr.; Payloader; belt conveyors.

C—The Southern Cotton Oil Co.
 P. O. Box 509; tel: 81, L.D. 92. (Main ofc: New Orleans, La.; dist. ofc: Macon, Ga.) R. C. Garrad, Mgr.

EAST POINT

B—Furman Fertilizer Works
 Tel: POplar 1-9526. (Owned by A. D. Adair & McCarty Bros., Inc., Atlanta, Ga.) D. V. Byrd, Supt. 20,000 tons.

Ba—International Minerals & Chemical Corp.
 Willingham Dr.; P. O. Box 69; tel: (ofc:) POplar 1-6643, (lab:) POplar 7-8671, (plant:) POplar 1-1528. (Main ofc: Chicago, Ill.) W. L. Baughcum, Area Mgr.; B. L. Garrett, Dist. Sales Mgr.; O. A. Dixon, Sou. area Prod. Supvr.; J. R. Archer, Chief Chemist; Cameron Sinclair, Plant Supt.

B—Tennessee Corp.
 (Main ofc: New York, N. Y.) J. K. Plummer, Gen. Mgr. 75,000 tons.

EDISON

Ca—Fidelity Products Co.
 P. O. Box 277; tel: 55. T. N. Wiggins, Ptnr. & Mgr. 5,000 t. cap.; 1,500 t. stor. 1 mill; elevator; platform dial scales; 1-ton rotary mixer; conveyors to bins; Payloader; automatic solution weigh tank.

FAYETTEVILLE

Redwine Bros.
 Tel: 2661. H. P. Redwine, H. H. Redwine & H. R. Redwine, Ptnrs. Plant at Tyrone, Ga.

FITZGERALD

C—The Ben Hill Co.
 J. J. Dorminy, Pres.; J. H. Dorminy, Jr., V.P.; Wilmer Dorminy, Sec.-Treas. 1,500 tons.

CPb—Planters Warehouse & Loan Co.
 228 E. Central Ave.; tel: 3108. Mrs. E. G. Hale, Pres.; J. H. Dorminy, Jr., V.P.; Sam F. Glenn, Jr., Gen. Mgr. & Pur. Agt.; J. W. McDonald, Sec.-Treas.; E. F. Gaines, Supt. 4,000 tons. 1 mill.

FORT GAINES

C—The Southern Cotton Oil Co.
 (Main ofc: New Orleans, La.; dist. ofc: Macon, Ga.) L. M. Ray, Mgr.

FORT VALLEY

C—The Fort Valley Oil Co.
 209 S. Macon St.; P. O. Box 667; tel: Taylor 5-5626. D. C. Strother, Pres. & Treas.; E. M. Whiting, V.P., Sec. & Pur. Agt.; Felton Spinks, Supt. 10,000 t. cap.; 1,000 t. stor. 1 mill, ½ ton; Atlanta Utility belt conveyor, elevators & hopper system; 2 Hough Payloaders.

GAINESVILLE

C—The Tennessee Corp.
 (Main ofc: New York, N. Y.) 15,000 tons.

GRIFFIN

CaFHPbm—Newton Crouch
 890 E. Solomon St.; P. O. Box 262; tel: 2276. Newton Crouch, Owner; Marvin Califf, Supt. 20,000 t. cap.; 5,000 t. stor. 1 mill; tractor shovels; hopper systems; conveyors.

CFpb—A. F. Gossett & Sons
 5th St. & E. Slaton Ave.; tel: 4411. Alex S. Gossett, Gen. Mgr.; H. H. Gossett, Asst. Mgr. 2,500 t. cap.; 500 t. stor. Tractor & complete equipment.

CFpb—Johnson Fertilizer Co., Inc.
 Williamson Rd.; P. O. Box 332; tel: 2064. Thomas E. Johnson, Pres.; W. F. Johnson, V.P.; Martha H. Johnson, Sec.-Treas.; Roger W. Scott, Plant Mgr. 5,000 t. cap.; 1,000 t. stor. 1 mill; 2 Payloaders.

JACKSON

CD—Nutt & Bond, Inc.
 Tel: 2711. V. H. Ham, Pres. & Mgr.; H. G. Harris, Plant Supt. 1,000-1,500 tons.

JEFFERSON

Ca—Carter Fertilizer Co.
 Tel: 265. James Carter & Vernon Carter. 3,000 tons. 1 mill; belt conveyors; tractor.

LAGRANGE

B—Swift & Co.—Plant Food Div.
 Tel: 4471. (Main ofc: Chicago, Ill.) C. D. Smith, Mgr.

LEARY

CaFPb—The Farmers Warehouse Co.
 Tel: 2761; plant tel: 2701. W. H. Jordan, Owner & Pur. Agt.; Wilson R. Owen, Jr., Plant Mgr. 12,000 t. cap.; 8,000 t. stor. 1 mill, 25-30 t./hr.; 4 Payloaders.

LOUISVILLE

CaF—Louisville Fertilizer & Gin Co.
 P. O. Box 192; tel: 2791-2701. R. N. Wigham, Pres.; K. H. Brown, V.P., Pur. Agt. & Mgr.; R. L. Scruggs, Supt. 10,000 t. cap.; 5,000 t. stor. 1 Atlanta Utility mill.

Vidette Fertilizer Co.
 P. O. Box 362; tel: 2631. W. J. Alexander, Pres. & Mgr. Plant at Vidette, Ga.

MACON

CDPbm—Central Georgia Fertilizer Co.
 350 Poplar St.; tel: 3-9123. Joe B. Hill, Sec.-Treas.; W. Joe Holt, Plant Mgr. 10,000 t. cap.; 6,000 t. stor. 1 mill, 25 t./hr.; 2 tractor shovels.

A—Cotton States Fertilizer Co.
 Ofc: 311 Persons Bldg.; P. O. Box 183; tel: 2-6405. C. B. Clay, Pres.; W. J. O'Shaughnessy, Sec.-Treas.; R. E. Lucas, Supt. 20,000 tons sulphuric acid, 40,000 tons superphosphate, 35,000 tons mixed fertilizer; 20,000 t. storage. 2 mills, 400 t./day; hopper systems; conveyors; tractors; Inglett & Corley automatic bagging machines; bulk loading facilities.

A—F. S. Royster Guano Co.
 Jeffersonville Rd.; P. O. Box 181. (Main ofc: Norfolk, Va.) E. A. Hall, Supt.

C—The Southern Cotton Oil Co.
 P. O. Box 646; tel: 3-5761, L.D. 29. (Main ofc: New Orleans, La.) W. G. Parrish, Macon Plant Mgr.; H. G. Richey, Dist. Mgr. for plants at Cartersville, Cordele, Dawson, Dublin, Ft. Gaines, Macon, McRae & Warrenton, Ga.

MCRAE

C—The Southern Cotton Oil Co.
 (Main ofc: New Orleans, La.; dist. ofc: Macon, Ga.) C. L. Tucker, Mgr.

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
S—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

MADISON

CFH—Mason Gin & Fertilizer Co.
Tel: 42. C. R. Mason, Pres.; Mrs. C. R. Mason, V.P.; C. L. Mason, Sec.-Treas. 2,000 tons. 1 mill, ½ ton batch; hopper; belt conveyor system; tractor shovel.

MANCHESTER

CaFHPb—James S. Peters Fertilizer Co.
Tel: 89. 233. James S. Peters, Dr. James S. Peters, Jr., Mrs. James S. Peters, Dr. S. L. Taylor, Mrs. S. L. Taylor, Mrs. Carolyn Burt Peters, Ptnrs.; Harrison W. Bray, Gen. Mgr.; Robert J. Brown, Plant Mgr. 6,000 t. cap.; 2,250 t. stor. Manual hopper system; tractor; conveyor.

MEIGS

CFPB—J. L. Pilcher & Sons, Inc.
J. L. Pilcher, Pres.; Chas. C. Pilcher, V.P.; J. S. Parkman, Plant Mgr. 6,000 to 8,000 tons.

CFP—Standard Fertilizer Co.

Tel: 210. T. T. Tipton, Pres.; T. C. Tipton, V.P. & Mgr.; J. W. Bozeman, Jr., V.P. 7,000 t. cap.; 2,000 t. stor. 2 tractor shovels; 5 conveyors; hopper.

MILLEN

CaPb—The Millen Fertilizer Co.
Tel: 51. E. M. Thorne, Pres.; A. W. Carter, V.P.; R. J. Royal, Supt. 5,000 t. cap.; 4,000 t. stor. 1 mill, 20 t./hr.; hopper system; 2 tractor shovels.

MONROE

CaFPb—H. M. Arnold Fertilizer Co.
100 S. Broad; tel: 6251. H. M. Arnold, Pres.; Harry Arnold, Jr., V.P.; Mrs. H. M. Arnold, Sec.-Treas.; R. M. Willingham, Supt. 12,000 t. cap.; 5,000 t. stor. 1 mill, 22 t./day; 3 Payloaders.

CF—Monroe Oil & Fertilizer Co.

(Subsidiary of Southern Cotton Oil Co.) 306 Madison Ave.; tel: 4271. J. T. Preston, Pres.; C. E. Harris, Sec.-Treas.; J. H. O'Kelly, Supt. 6,000 t. cap.; 2,000 t. stor. Payloaders.

MONTICELLO

CPbm—The Farmers Union Warehouse Co.
Frobel St.; tel: 2911, 2913. D. N. Harvey, Pres.; H. G. Cress, V.P.; Herschel Allen, Sec.-Treas.; E. S. Goolsby, Gen. Mgr.; Wilburn Lowery, Supt. 2,000 t. cap.; 5,000 t. stor. Atlanta Utility hoppers; conveyors and sacking equipment.

MOULTRIE

CaFPm—Shepard Fertilizer Co.
P. O. Box 329; tel: 406. W. E. Shepard, Kirk Shepard & Louis Shepard, Ptnrs.; Guyte McLendon, Supt. 10,000 t. cap.; 6,000 t. stor. 1 mill, 30 t./hr.; conveyors; tractor shovels; automatic sacking equipment. Plant also at Doerun, Ga.

AaFPbm—C. O. Smith Guano Co.
P. O. Box 69; tel: 146, 247 & 105. C. O. Smith, Sr., C. O. Smith, Jr., and Jack C. Smith, (Mgr. Pest. Div.) Ptnrs.; O. E. Perry, Supt. 100,000 tons. 6 mills; complete belt systems Inglett & Corley hopper batching system; Hough tractor shovels. Plant also at Douglas, Ga.

CaF—T. F. Taylor Fertilizer Works, Inc.
Tel: 24. T. F. Taylor, Pres., Treas. & Pur. Agt. 15,000 t. cap.; 15,000 t. stor.

NASHVILLE

CaFPf—Berrien Products Co., Inc.
Marion & John's St.; P. O. Box 355 tel: 3381. J. D. Tygart, Pres.; W. W. Moore, V.P., Gen. Mgr., Pur. Agt. & Mgr. Pesticide Div.; J. H. Harvey, V.P.; Jas. A. Harnage, Supt. 15,000 tons. 1 mill, 1 ton; cluster hoppers; conveyors; 3 Payloaders; car puller; bagging hoppers; automatic overhead conveyor system.

NEWBORN

CaFP—Planters Warehouse Co.
Tel: 5024. Ralph N. Adams, Owner. 2,000 t. cap.; 1,000 t. stor. 1 mill, 10 t./hr.; Payloader; fork lift; drag chain conveyor; mixer.

NEWMAN

CaFP—Georgia Belle Guano Co.
First Ave.; P. O. Box 589; tel: 691. Millard C. Farmer, Pres. & Mgr.; Herbert A. McKoy, Sec.-Treas. 10,000 t. cap.; 2,500 t. stor. 1 mill, 20 t./hr. Payloader; bulk belt conveyors; hopper system.

OCILLA

CaF—Ocilla Oil & Fertilizer Co.
Tel: 53. Otto Griner, Pres. & Mgr.; Jacob D. Paulk, Sec.-Treas.; A. T. Owen, Plant Mgr. 10,000 t. cap.; 6,000 t. stor. 1 mill, 30 tons per hr.; 8 unit hopper system; automatic solution equipment; conveyors; tractor shovels.

OMEGA

CaFPm—Omega Fertilizer Works
Tel: 2101, 2016. J. D. McCleod, Sr., & J. D. McCleod, Jr., (Pur. Agt.), Ptnrs.; E. G. Evans, Plant Mgr. 10,000 t. cap.; 4,000 t. stor. 9-bin hopper system; automatic ammonia-tion equipment; belt conveyors; Payloaders.

PELHAM

A—Pelham Phosphate Co.
P. O. Box 463; tel: 3261, 8178, 3381. L. D. Hand, Pres.; C. W. Hand, V.P.; F. B. Hand, Asst. to Pres.; J. A. Oxford, Sec.-Treas.; A. J. Cooke, Supt.; H. H. McDonald, Sales Mgr. 60,000 t. cap.; 18,000 t. stor. 6-hopper system; belt system for mixed fertilizers; belt system for conveying superphosphate.

REYNOLDS

CaHP—Hinton & Co.
P. O. Box 266; tel: 117. B. W. Hinton, Owner; B. W. Hinton, Jr., Mgr. 3,500 t. cap.; 2,000 t. stor. 1 mill, ½ ton; Payloader; conveyor used in mixing.

ROCHELLE

CaF—Doster Guano Co.
N. B. Doster Owner; George Tipples, Supt. 8,000 t. cap.; 8,000 t. stor. 1 mill, 1 ton; 3 conveyors; 2 tractor shovels.

Cf—Mashburn & Fitzgerald
(Partnership) H. S. Fitzgerald, Mgr. Fertilizer Dept. 1,000 tons.

ROME

A—Virginia-Carolina Chemical Corp.
Tel: 3402. (Main ofc: Richmond, Va.)

ROYSTON

CaF—McConnell Fertilizer Co.
P. O. Box 167; tel: 8275. Hoke McConnell, Pres.; Cecil Hancock, Plant Mgr. 8,000 tons.

RUTLEDGE

CF—Rutledge Manufacturing Co.
R. W. Wallace, Pres.; J. W. Hollis, V.P.; J. W. Herren, Treas.; J. L. Saye, Sec. & Plant Mgr. 4,000 tons.

SANDERSVILLE

CaFHPb—Carr-Boatright
T. C. Carr, J. H. Boatright, Ptnrs. 3,500 tons. Atlanta Utility mill.

SAVANNAH

A—The American Agricultural Chemical Co.
Lathrop Ave; P. O. Box 567; tel: 3-6662. (Main ofc: New York, N. Y.) B. C. Griffin, Mgr.; C. R. LeCroy, Supt.

CaPm—Blue Belt Fertilizer Co.
Lathrop Ave.; P. O. Box 692; tel: 3-1101, 3-1102. C. W. Smith, Pres.; C. B. Smith, V.P.; M. M. James, Sec.-Treas. 15,000 t. cap.; 12,000 t. stor. 2 mixing units; 3 tractors.

CaPm—The Cotton Producers Assn.
P. O. Box 544; tel: 2-3339. (Main ofc: Atlanta, Ga.) A. E. Lord, Supt. 20,000 t. cap.; 12,000 t. stor. 2 mills; hopper systems; conveyors; tractor shovels.

Ca—The Moore Co.

Louisville Rd. & Fair St.; P. O. Box 181; tel: 2-3334. James N. Moore, Jr., Pres.; T. G. Moore, V.P.; James N. Moore, III, Sec.-Treas.; E. W. Mathis, Plant Mgr. 3,000 t. cap.; 3,000 t. stor. 1 mill, 150 tons daily; belt conveyor.

BaFHPbm—Mutual Fertilizer Co.

124 E. Bay St.; P. O. Box 666; tel: 8115. Charles Ellis, Chmn; Charles Ellis, Jr., Pres. & Treas.; H. Dana Stevens, Sec.; James S. Salter, Plant Mgr. 40,000 t. cap.; 20,000 t. stor. 3 mills, 50, 40 & 30 t./hr.; hopper system; conveyors, Payloaders; Inglett & Corley bagger; automatic ammonia scales; Raymond mill; Sturtevant den.

Ca—The Reliance Fertilizer Co.

106 Bay St., East; P. O. Box 529; tel: 3-2133, 3-2134. John L. Cope, Pres. & Treas.; James E. Cope, V.P.; Donald H. Sack, Sec.; M. G. Waters, Sr., Supt. 25,000 t. cap.; 12,000 t. stor. 2 mills, 1 ton Sturtevant, 2 ton Worthington Ransome; Davidson-Kennedy 9-bin hopper system.

AagPbm—Southern Fertilizer & Chemical Co.

16 E. Bay St.; P. O. Box 1158; tel: 4-7281. A. D. Strobhar, Pres.; W. Dewey Cooke, V.P.; Allen D. Brent, V.P., Prod.; W. W. Harley, V.P., Sales; C. E. Donnelly, Plant Mgr. 100,000 t. cap.; 60,000 t. stor. Cranes; hopper systems; conveyors; tractors. Plants at Atlanta, Ga.; Charleston & Roebuck, S. C.

APbm—Southern States Phosphate & Fertilizer Co.

A.C.L. Wharf; P. O. Box 546; tel: 2-1101. F. R. Dulany, Pres., Treas. & Pur. Agt.; W. H. Read, V.P.; F. D. Bishop, V.P.; Mrs. Mary D. Lovett, Sec.; J. D. Lee, Supt. of Prod. 150,000 t. cap.; 50,000 t. stor. 5 mills (rock mills—8 tons per hr., regular mills—60 tons per hr.); completely integrated bulk conveyor systems and hopper mixing system; 13 tractors with buckets; 2 Lorain shovels; 1 Bay City dragline.

C—Swift & Co.—Plant Food Div.

Anderson Ave.; P. O. Box 1258; tel: 4-5161, 4-5162. (Main ofc: Chicago, Ill.) W. U. Bremer, Mgr.

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
a—ammoniate g—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

A—Virginia-Carolina Chemical Corp.
Tel: 3-7778 & 3-7779; factory tel: 2-1813. (Main ofc: Richmond, Va.)

SENOIA

C—C. P. Daniel's Sons
F. P. Daniel, Plant Mgr. 3,000 t. cap.; 500 t. stor.

C*—P. R. McKnight & Son Gin Co.
P. R. McKnight, Owner; J. C. Johnson, Supt. 1,000 tons.

SOCIAL CIRCLE

CaFP—Circle Manufacturing Co.
Owned by Duval & Co. G. M. Duval, Jr., Pres.; Fred B. Duval, V.P.; L. Stanton Duval, Sec.-Treas. 3,000 t. cap.; 1,200 t. stor. 1 mill, 15 t./hr.; 2 Payloaders.

SOPERTON

CaF—Soperton Guano Co.
Tel: 128; plant tel: 171. J. E. Hall, Sr., Pres.; J. E. Hall, Jr., V.P., Mgr.; R. E. Ward, Asst. Treas.; Sidney Smith, Supt. 4,500 t. cap.; 3,200 t. stor. 1 mill, ½ ton; belt conveyor from mixer to bins.

STATESBORO

CaPm—Smith Fertilizer Co.
Ofc: 14 E. Vine St.; plant: E. Cherry St.; P. O. Box 264; tel: PO 4-3511. H. Z. Smith, Sr., Owner; W. R. Smith, Ofc. Mgr.; H. Z. Smith, Jr., Mgr. 4,000 t. cap.; 1,000 t. stor. Hopper system; conveyors; Payloaders.

SYLVANIA

CaFPm—Evans, Reed & Williams
Partners: David W. Reed, J. P. Evans (Pur. Agt.), H. A. Williams, Jr.; George Lee, Plant Mgr. 10,000 t. cap.; 4,000 t. stor. 1 mill; complete conveyor system; 4 hoppers over Cunningham sealed scale (dial) for formulating; 2 Payloaders.

C—Screven Oil Mill

Tel: 3861. P. H. Brewster, Pres.; G. E. Miller, Sec. & Mgr.; W. E. Brewster, Treas.; A. L. Landing, Supt. 8,000 t. cap.; 4,000 t. stor. 1 mill; mixer; elevators; conveyors; 2 Payloaders.

THOMASTON

C—A. A. Britt Fertilizer Co.
Plant: Cherry St. at C. of Ga. Ry.; ofc: 219 W. Center St.; P. O. Box 526; tel: 2237. A. A. Britt, Sr., Owner; R. W. Britt, Ptnr. & Plant Mgr. 2,000 t. cap.; 600 t. stor. 1 mill, 15 t./hr.; sewing machine; Hough Payloader.

THOMASVILLE

CF—Thomasville Fertilizer Co.
118 Remington Ave.; Box 417; tel: 207. J. R. Alexander, Pres.; J. E. Sanders, Sec.-Treas.; Ivan B. Stegall, Supt. 8,000 t. cap.; 4,000 t. stor. 1 mill, 700-lb.; Link-Belt conveyor; hoppers; Payloader.

THOMSON

CFPb—McDuffie Oil & Fertilizer Co.
224 Railroad St.; tel: 203. Paul A. Bowden, Pres.; Mrs. Sarah B. Dobbins, V.P.; Mrs. Beulah C. Lane, Sec. 2,000 t. cap.; 2,000 t. stor. 1 mill; hopper system; shovels; Payloader.

TIFTON

Ba—International Minerals and Chemical Corp.
Ferry Lake Rd.; P. O. Box 56; tel:

74. (Main ofc: Chicago, Ill.) T. M. Freeman, Supt.

TYRONE

BaF—Redwine Brothers
Tel: 2261. (Main ofc: Fayetteville, Ga.) W. F. Farr, Plant Mgr. 5,000 t. cap.; 3,000 t. stor. 1 mill, 300 t/day.

VALDOSTA

A—Georgia Fertilizer Co.
S. Patterson St. R. L. King, Pres. & Gen. Mgr.; Hoke Smith, V.P., Sec.-Treas. 75,000 t. cap.; 45,000 t. stor. 5 mills, 400 t./day; hopper systems; mechanized basing units; 3 drag lines; 3 large Payloaders, 6 small Payloaders; 6 tilt dump Hough transporters; 1 long overhead belt conveyor & Clark truo-tractor length of plant; 6 cross belt conveyors.

VIDALIA

***—Vidalia Chemical Co.**
(Owned by Southern Fertilizer & Chemical Co., Savannah, Ga.) O. R. Swofford, Mgr. 26,000 tons.

VIDETTE

CP—Vidette Fertilizer Co.
(Office at Louisville, Ga.) W. J. Alexander, Pres. & Mgr. 600 t. cap.; 300 t. stor.

VIENNA

C*—Dooley Fertilizer Co.
N. E. Brown, Owner; W. M. Easom, Supt. 1,500 tons.

WARRENTON

C—The Southern Cotton Oil Co.
(Main ofc: New Orleans, La.; dist. ofc: Macon, Ga.) W. M. Williams, Jr., Mgr.

WASHINGTON

CagF—Burdette Mill & Gin Co.
Depot St.; tel: 435-W. Walter E. Burdette, Owner; Henry Harris, Mgr. 1,200 t. cap.; 2,000 t. stor. 1 mill, ½ ton; conveyors; bagging hoppers; tractors; shovels.

CaFH—Sunbeam Services & Supplies, Inc.
Tel: 424. M. H. Barnett, Pres.; Charles L. Sanders, V.P. & Treas.; J. L. Vandiver, V.P. & Mgr.; Earle Bufford, Sec. 2,500 t. cap.; 500 t. stor. 1 mill; 2 Payloaders.

WAYNESBORO

CaFH—Waynesboro Fertilizer Co.
Myrick St.; tel: 2106, 2683. R. C. Neely, Pres.; R. C. Neely, Jr., V.P. & Mgr.; J. W. Walker, Sec.-Treas.; J. B. McCullough, Prod. Mgr. 6,000 t. cap.; 2,500 t. stor. 1 mill; 1 ton Ransome mixer; 2 longitudinal conveyors; one cross conveyor; Inglett automatic hopper system; Hough Payloader.

WINDER

CPb*—Southern Guano Co.
S. W. Draper, Pres.; C. O. Maddox, Sec.-Treas. 5,000 tons.

WRIGHTSVILLE

C—Lovett & Co., Inc.
Tel: 3448. W. H. Lovett, Pres.; W. E. Lovett, V.P.; Lewis L. Lovett, Sec.-Treas.; B. B. Blount, Supt. 3,000 t. cap.; 2,500 t. stor. 1 mill, ¼ ton; chain conveyor for removing fertilizer; Payloader for bringing in materials.

ZEBULON

CF—Zebulon Ginning & Fertilizer Co.
(Subsidiary Southern Cotton Oil Co., New Orleans, La.) H. G. Richey, Pres.; M. L. Dunn, V.P.; A. W. Quattlebaum, Sec.-Treas. & Mgr. 10,000 t. cap.; 2,500 t. stor. 1 dry mixing unit.

IDAHO

AMERICAN FALLS

CFHP—Fertilizer Service, Inc.
(Main ofc: Twin Falls, Idaho) Preston Osterhaut, Mgr.

BLACKFOOT

CFHP—Agricultural Services, Inc.
(Subsidiary of Fertilizer Service, Inc., Twin Falls, Idaho.)

BOISE

EDF—Cimota Enterprises, Inc.
1111 Houston Rd.; tel: 3-0687. George N. Worden, Pres.; Fred A. Potter, V.P.; Jess L. Rutledge, Sec.-Treas. Mining mineral materials containing primary and trace elements. 1 mill, 50 t./day; hopper systems; conveyors; tractor shovels; etc.

C*—Soillife, Inc.

H. T. Hitt, Pres.; J. P. Gillmore, V.P. & Gen. Mgr.; Conover Wright, Treas.; D. C. Regan, Sec. & Prod. Mgr. 50,000 tons—finished; 300,000 tons mine run minerals.

BURLEY

CFHP—Fertilizer Service, Inc.
1028 Overland; P. O. Box 509; tel: ORchard 8-2214. (Main ofc: Twin Falls, Idaho) M. R. Reynolds, Mgr.

CALDWELL

CFHPm—Simplot Soilbuilders—Div. J. R. Simplot Co.
Tel: 9-3694. (Main ofc: Boise, Idaho; Fert. Div. Hdq. Pocatello, Idaho.) Ralph Nyblad, Gen. Mgr.; Lester Davis, Plant Mgr. 10,000 t. cap.; 800 t. stor.

IDAHO FALLS

CGHPb*—Idaho Falls Bonded Produce & Supply
Box 337. A. G. Stanger, Pres.; Marshall Keyes, Pur. Mgr. & Mgr. Pesticides Div.; Francis Nelson, Plant Mgr. 10,000 tons. 1 mill, 40-50 tons daily; unloading bulk elevator; elevator; ½ ton mixer.

C*—Simplot Soilbuilders—Div. J. R. Simplot Co.
Tel: 63. (Main ofc: Pocatello, Idaho.) Jack L. Wurston, Gen. Mgr. 10,000 tons.

CPm—Utah Idaho Sugar Co.
(Main ofc: Salt Lake City, Utah.) W. J. O'Bryant, Plant Mgr. 45,000 t. cap.; 3,500 t. stor. Tractor shovel; conveyors; hopper system; elevator; scales; mixer; bag stackers.

LEWISTON

CPm—North Idaho Chemical Co., Inc.
29th & Railroad; P. O. Box 622; tel: 3-5931. Chas. A. Fite, Pres. & Plant Mgr.; Allyce I. Fite, Sec.-Treas. 5,000 t. cap.; 1,200 t. stor.

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
S—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

NAMPA

CPbm—Lewis Yoder Co., Inc.
12 15th Ave., S.; P. O. Box 788; tel: 6-4618. John L. Yoder, Pres.; James G. Yoder, V.P. & Pur. Agt.; K. Mizoguchi, Plant Mgr.

POCATELLO

BgEFHPm—J. R. Simplot Co.—Fertilizer Div.
P. O. Box 912; tel: 3392. (General ofc: Boise, Idaho.) Main ofc: fert. div. W. Grant Kilbourne, Gen. Mgr. Ben D. McCollum, Sales Mgr.; Dale Dunn, Plant Mgr.; Oscar Finkelnburg, Plant Supt. 90,000 t. cap.; 50,000 t. stor. 4 mills. 2 15 t./hr., 2 5 t./hr.; 2 shovels; 2 tractors; 2 scooploaders; Payloader; fork lifts. Plants also at: Greeley & Swink, Colo.; Caldwell, Idaho Falls & Twin Falls, Idaho; Klamath Falls, Oreg.

TWIN FALLS

CFHP—Fertilizer Service, Inc.
124 Blue Lakes, S.; tel: 1930. W. H. Shillington, Pres.; G. T. Newcomb, Treas. & Mgr.; Lenoard Jacob, Sec. 500 tons storage. Mixers; conveyors. Plants also at: American Falls, Blackfoot & Burley, Idaho.

CFHPbm—Simplot Soilbuilders—Div. J. R. Simplot Co.
700 Shoshone St., West; P. O. Box 110; tel: 2478. (Main ofc: Boise, Idaho; Fert. Div. Hdq: Pocatello, Idaho) J. D. McCollum, Gen. Mgr.; John H. Allen, Plant Mgr. 20,000 t. cap.; 1,000 t. stor. - mill, 10 t/day; underground bulk unloader; mechanical-unloading 60 ton dry storage bin (outside); outside-inside conveyor system.

ILLINOIS

ALLERTON

CaFP—Allerton Fertilizer Co.
Tel: 1F2. (Owned & operated by Allerton Lumber Co.) Harry T. Allen & Ralph B. Allen, Ptnrs. 7,500 t. cap.; 2,500 t. stor. 1 mill, 35 t/hr.; 3 conveyors; 4 overhead bins; hopper; scale; tractor shovel.

ASHKUM

BagPm—Ashkum Fertilizer Co.
Tel: 47. D. L. Peterson, Mgr.; Charles Durham, Supt. 20,000 t. cap.; 12,000 t. stor. Hopper system; conveyors; 3 Payloaders.

ATLANTA

C*—Hoblitt-Bonnett Fertilizer Co.
Tel: 3481. Frank D. Hoblitt, Ptnr. & Prod. Mgr.; Yontz Bonnett, Ptnr. & Pur. Agt. 4,000 tons.

BELVIDERE

C—Boone Soil Service Co.
Menominee & Blaine Sts.; tel: 3969. L. J. Shappert, Ptnr. & Gen. Mgr.; F. W. Shappert, Ptnr. 1,500 t. storage. 1 mill, 1 ton; hopper system, belt conveyors; Hough end loader; mixer equipped for installation of ammoniator.

CAIRO

Cag—Darling & Co.
P. O. Box 27; tel: 317 (Main ofc: Chicago, Ill.) R. S. Lewis, Plant Mgr. 30,000 t. cap.; 6,000 t. stor.

CALUMET CITY

A—Swift & Co.—Plant Food Div.
P. O. Box 148; tel: Torrence 2-7220 & 2-7221. (Main ofc: Chicago, Ill.) K. Wagenseller, Mgr.

CHAMPAIGN

CaDFLHPb—Crop Service Co.
Rte. 2. R. W. Pachaly, Pres.; F. J. Foersterling, Sec.-Treas.; H. J. Schultz, Plant Mgr. 10,000 t. cap.; 5,000 t. stor.

CHICAGO

Darling & Co.
4201 S. Ashland Ave.; tel: YArds 7-3000. A. R. Bethke, V.P.; G. K. Walton, Mgr. Fert Div. Plants at: Cario & E. St. Louis, Ill.; Cedar Rapids, Iowa.

Illinois Farm Supply Co.
100 E. Ohio St.; tel: Whitehall 4-3171. L. E. Quiram, Mgr. Plant Food Div. Plants at: E. St. Louis & Tuscola, Ill.

The International Minerals & Chemical Corp.

Main ofc: 20 N. Wacker Dr.; tel: FIncial 6-1800. Louis Ware, Pres.; James P. Margeson, Jr., Exec. V.P.; Maurice H. Lockwood, V.P.; Plant Food Div.; Arthur R. Cahill, V.P.; & Treas.; George W. Moyers, V.P.; Phosphate Minerals Div.; Howard F. Roderick, V.P.; Phosphate Chemicals Div.; A. Norman Into, V.P.; Potash Div.; Dr. Paul D. V. Manning, V.P., Research Div.; Edward D. McDougal, Jr., V.P. & Gen. Counsel; Norman J. Dunbeck, V.P.; Industrial Minerals Div.; T. M. Ware, V.P., Engineering Div.; C. M. Edwards, Corporate Sec.; Edward Tubbs, Comptroller; J. P. Burrows, Gen. Pur. Agt.; A. C. Thornton, Industrial Relations Mgr.; E. J. Landis, Gen. Traffic Mgr.; Stacy C. Thompson, Gen. Credit Mgr.; John D. Zigler, Oper. Mgr., Plant Food Div.; G. J. Carney, Marketing Staff Mgr., Plant Food Div.; R. W. Keller, Prod. Staff Mgr., Plant Food Div.; F. S. Walters, Northern Area Prod. Supvr., Plant Food Div.; Dr. R. P. Thomas, Technical Service Supvr., Plant Food Div.; R. A. MacDonald, Process Development Supvr., Plant Food Div.; H. F. Lange, Chief Engr., Plant Food Div.; Rufus G. Hartig, Chemical Prod. Supvr., Plant Food Div.

Industrial Chemicals Div. plant at: Niagara Falls, N. Y.

Phosphate Chemicals Div. plant at: Bartow, Fla.

Phosphate Minerals Div. Plants at: Bartow, Fla. & Godwin, Tenn.

Potash Div. plant at: Carlsbad, N. M.

Plant Food Div. plants at: Cullman, Florence & Montgomery, Ala.; Texarkana, Ark.; Jacksonville, Mulberry & Pensacola, Fla.; Americus, Augusta, East Point & Tifton, Ga.; Chicago Heights, Ill.; Mason City, Iowa; Somerset, Ky.; Houlton, Me.; Woburn, Mass.; Tupelo, Miss.; Buffalo, N. Y.; Wilmington & Winston-Salem, N. C.; Cincinnati, Ohio; Hartsville & Spartanburg, S. C.; Clarksville & Greeneville, Tenn.; Ft. Worth, Tex.

SLPf—Smith Equipment and Supply Co.

1615-21 N. Central Ave. (39); tel: National 2-0027. Archer H. Smith,

Pres.; William T. DuBrock, V.P. & Treas.; Russell E. Q. Johnson, Sec.; G. V. Transier, Supt. 1,500 t. cap.; 100 t. stor.

Swift & Co.—Plant Food Div.

Main ofc: 41st & Packers Ave., Union Stock Yards (9); tel: YArds 7-4200. Porter Jarvis, Pres.; C. T. Prindeville, V.P.; A. L. Bruckner, Treas.; A. H. Fritschel, Sec.; W. F. Price, Gen. Mgr., Plant Food Div.; B. W. Guess, Pur. Agt., Plant Food Div. Plants at: Hayward & Los Angeles, Calif.; Agricola (Phosphate Rock Mine) & Winter Haven, Fla.; Albany, Atlanta, LaGrange & Savannah, Ga.; Calumet City & National Stock Yards, Ill.; Mason City, Iowa; Harvey & Shreveport, La.; Baltimore, Md.; Greensboro & Wilmington, N. C.; Cleveland & Greenville, Ohio; N. Portland, Oreg.; Columbia, S. C.; Houston & Tyler, Tex.; Norfolk, Va.; Madison, Wisc.; New Toronto, Ont., Canada.

Victor Chemical Works

155 N. Wacker Dr. (6); tel: DEarborn 2-4010. Plant at Chicago Heights, Ill.

Ca—Wilson & Co.

4100 S. Ashland Ave. (9); tel: YArds 7-4000, Ext. 281. J. D. Cooney, Pres.; F. K. Foss, V.P.; C. E. Claflin, Mgr. Fert. Div.; J. P. Nelson, Supt. 10,000 tons. Mixer; overhead conveyors to base bins; bag conveyors.

CHICAGO HEIGHTS

A—Armour Fertilizer Works

10th & State Sts.; P. O. Box 287; tel: SKyline 5-0486 & 5-0487, Inter-Ocean 8-9870 & 8-9871. (Main ofc: Atlanta, Ga.) G. W. Woodhull, Div. Mgr.

Ba—International Minerals & Chemical Corp.

16th & State Sts.; P. O. Box 277; tel: SYyline 4-1140 (ofc.) & 4-2912 (plant). (Main ofc: Chicago, Ill.) E. T. Potterton, Dist. Sales Mgr.; D. B. Rust, Supt.

CE—Victor Chemical Works

(Main ofc: Chicago, Ill.) Phosphates & phosphoric acid; 10-52-17 plant starter.

CLINTON

CaFHLHPbm—Marquiss Farm Supply Co.

Box 127; tel: 984. Charles E. Marquiss, Owner and Mgr.; Fred O. Price, Asst. Mgr.; Tom Edwards, Sales Mgr. 10,000 t. cap.; 1,600 t. stor. 2 mills, 15 t./hr. each; hopper system; conveyor; 2 elevators; 3 tractors; 2 shovels; 10 trucks.

COLFAX

CFLHPb—Meiners Soil Service, Inc.

Tel: 73. Paul Orr, Pres.; Elmo Meiners, V.P.; Kenneth D. Orendorff, Sec.-Treas. 2,500 t. cap.; 400 t. stor. Mixer; shovel loader; conveyors; hopper; elevator.

CONGERVILLE

CFHLP—Schrock Fertilizer Service—Div. Schrock Bros. Co.

(Main ofc: Tel: 801. J. B. Schrock, Pres.; A. J. Schrock, V.P. & Treas.; Kenneth W. Cross, V.P.; E. C. Rokey, Sec.; J. J. Fuller, Pur. Agt. 20,000 tons. (Associated serving

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
a—ammoniate g—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

local areas have combined capacity of 50,000 tons.) Plant also at Bern, Kans.

DANVILLE

B—The Buhner Fertilizer Co., Inc.
Box 152; W. Ross Lane; tel: 982, 983. (Main ofc: Seymour, Ind.)
Floyd G. Smith, Sales Mgr.; Chas. Everhart, Plant Mgr. 50,000 tons. 3 mills; bagging machines; Broadfield den; basing mill; bulk loading equipment; overhead crane; 3,000 ft. of conveyors.

Ba—Federal Chemical Co.
West Ross Lane; P. O. Box 11. (Main ofc: Louisville, Ky.) John H. Langsford, Plant Mgr.; F. A. Houk, Sales Mgr.; E. O. Clements, Asst. Sales Mgr.

DECATUR

CFPbm—Mid Way Soil Center, Inc.
421 W. William St.; P. O. Box 368; tel: 4311. E. T. Evans, Pres.; H. P. Myers, V.P., Treas. & Plant Mgr.; F. E. Evans, Sec. 4,000 t. cap.; 800 t. stor. 1 mill, 20 t./hr. Mechanized with air controls; automatic scales; Payloader.

CaF—C. D. Perkinson Co.
1101 E. Sangamon St.; P. O. Box 805; tel: 3-6812. C. D. Perkinson, Owner & Mgr.; I. M. Perkinson, Ptnr. 20,000 t. cap.; 12,000 t. stor. 2 mills, 20 & 60 t./hr.; 2 hopper systems; 5 elevators; 4 belt conveyors; 2 drags; 5 screws; 3 tractors.

EAST ST. LOUIS

B—Armour Fertilizer Works
P. O. Box 312; tel: UPTon 4-6507, BRidge 1-0606. (Main ofc: Atlanta, Ga.) F. M. Hudson, Div. Mgr.

BagPm—Darling & Co.
Mississippi Ave. (Monsanto); P. O. Box. (Main ofc: Chicago, Ill.) W. W. Read, Plant Mgr. 100,000 tons.

B—Illinois Farm Supply Co.
6400 Collinsville Rd.; tel: UPTon 4-3568. (Main ofc: Chicago, Ill.) T. H. Laurent, Plant Mgr. 50,000 tons.

B—Virginia-Carolina Chemical Corp.
Tel: BRidge 1-3720 & LD UPTon 4-3744; factory tel: BRidge 1-3313. (Main ofc: Richmond, Va.)

EFFINGHAM

CaFPm—Effingham Equity, Inc.
P. O. Box 480; tel: 361, 362, 1834. Paul Goldstein, Gen. Mgr.; William John, Plant Mgr. 15,000 t. cap.; 2,500 t. stor. Batching hoppers; conveyors; tractors.

EL PASO

LH—Aylward Fertilizer Co.
(Main ofc: Sullivan, Ill.)

FULTON

A—The American Agricultural Chemical Co.
P. O. Box 150; tel: 2211. (Main ofc: New York, N. Y.) G. F. Cummings, Mgr.; P. H. Armstrong, Supt.

GRANITE CITY

O—Smith Rowland Co.—Div. Smith-Douglass Co., Inc.
Tel: GLEnview 2-6160. (Main ofc: Norfolk, Va.) V. J. Kovarik, Plant Mgr. Nitrogenous tankage.

HANNA CITY

CF—Mid-State Supply Co.
Tel: 217 (ofc: Peoria, Ill.) Robert E.

Bass, Supt. 3,000 t. cap.; 300 t. stor.

MANITO

O—Manito Filler Co.
(ofc: Peoria, Ill.) Thomas Charlton, Supt. 5,000 tons organic earth.

MEREDOSIA

CaFPm—A. B. Chrisman Grain Co.
Tel: 58, 42. Allen B. Chrisman, Pres.; Claude H. Jewsbury, Sec. & Mgr.; Jack Wasson, Sales Mgr.; Joe Smith, Plant Mgr. 6,000 t. cap.; 3,000 t. stor. 1 mill, 30 t./hr.; 2 tractors; air control hopper system; 3 conveyors; mixer; 4 legs; screen; bagging mill.

MILAN

CDGPb*—Whitley Chemical Corp.
Tel: 7-2458. H. Whitebook & A. Levin. 50 tons per day.

MORRIS

Ba—Gilchrist Plant Food Co.
525 W. Washington St.; tel: 609. D. R. Gilchrist, Pres.; R. S. Gilchrist, V.P. 5,000 t. cap.; 3,000 t. stor. 2 mills, 10 t./hr.; hopper system; all belt movement.

MURPHYSBORO

CH—Hy Yield Soil Service
514 Walnut St.; tel: 1376. Ted Powers, Pres.; Rodell Rhine, Div. Mgr. 10,000 t. cap.; 1,000 t. stor. (Plant under construction at publication; scheduled for January, 1956 operation.)

NATIONAL STOCK YARDS

A—The American Agricultural Chemical Co.
Box E; tel: (sales) BRidge 4617, (works) BRidge 4616. (Main ofc: New York, N. Y.) J. W. Engle, Mgr.; R. E. Lehmkuhl, Supt.

B—Swift & Co.—Plant Food Div.
Tel: BRidge 1-6479. (Main ofc: Chicago, Ill.) A. N. D'Aubert, Mgr.

PAXTON

CFPbm—A. B. Schofield Soil Service
415-425 N. Market St.; tel: 102. A. B. Schofield, (Supt.), Milton R. Schofield & Mrs. W. S. Haltom, Ptnrs. 45,000 t. cap.; 7,800 t. stor. 1 mill; 2 tractor shovels; 5 hoppers; 9 conveyors.

PONTIAC

CaFPm—Steve Turner Farm Seeds
1505 N. Aurora St.; tel: 5376, 5396. Steve Turner & Jack Turner, Ptnrs. 5,000 t. cap.; 4,000 t. stor. 1 mill, 1 ton; conventional mixing plant; elevators; conveyors; Payloaders.

PEORIA

Manito Filler Co., Inc.
806 Lehmann Bldg. (2); tel: 6-6524. L. H. Erler, Pres.; Mabel C. Furey, V.P. & Treas.; John C. Kocsoban, Sec. Plant at Manito, Ill.

QUINCY

CaDFGHLpBm—Duesterhaus Farm Supply
Foot & Oak Sts.; P. O. Box 248; tel: BA 2-5442. Paul J. Duesterhaus, Owner; Waldo Flesner, Plant Mgr. 5,000 t. cap.; 5,000 t. stor. 1 mill, 30 t./hr.; 1 mixer, 1 ton; 1 under-track conveyor; 1 loading conveyor; 1 tractor loader; 1 car scoop tractor. Installing ammoniator & liquid mix plant between '54-'55 & '55-'56 season.

ROCHELLE

CaLPm—H. D. Campbell Co.
238-248 Main St.; tel: 460. H. D. Campbell, Pres.; S. D. Prideaux, Prod. Mgr.; J. D. Allen, Prod. Supt.; D. F. Campbell, Sec. 100,000 t. cap.; 400 t. stor. Plant also at Strawberry Point, Iowa.

STREATOR

A—Smith-Douglass Co., Inc.
P. O. Box 457. (Main ofc: Norfolk, Va.) R. J. Fitzgerald, Branch Mgr.

SULLIVAN

LH—Aylward Fertilizer Co.
114 N. Fuller St.; tel: 2691. Edwin Aylward, Pres.; Arthur Aylward, Supt. 3,000 tons storage. Plant also at El Paso, Ill.

TUSCULA

Cag—Illinois Farm Supply Co.
(Main ofc: Chicago, Ill.) Ed Causey, Plant Mgr. 50,000 tons.

E—U. S. Industrial Chemicals Co.—Div. National Distillers Products Corp.
(Main ofc: New York, N. Y.) David J. Patterson, Plant Mgr. Ammonia, nitrogen solutions & sulfuric acid.

INDIANA

BRIDGETON

CO—Benson-Maclean
Tel: (Rockville) 2974-R. W. L. Benson, E. L. Killion. Solution & soluble pellet & powder plant food; organic fertilizer materials, hormone-chemicals & bacterial additives.

BUTLER

Ca—Longaker Mills, Inc.—Div. Federal Chemical Co.
300 Depot St.; tel: 268. (Main ofc: Louisville, Ky.) J. D. Stewart, Jr., Pres.; J. T. Marshall, V.P. & Plant Mgr.; G. W. Shields, Treas.; Floyd Lucas, Sec. & Div. Sales Mgr.; L. L. Martin, Asst. Sales Mgr. 18,000 t. cap.; 4,000 t. stor. 2 mills, 35 t./hr.; hopper systems for batching.

COLUMBIA CITY

C—Indiana Farm Bureau Cooperative Assn., Inc.
(Briggs Plant) P. O. Box 244 (address all mail to: A. R. Mullin); tel: (Indianapolis) MEloose 1-8361. (Main ofc: Indianapolis, Ind.) Arthur R. Mullin, Fert. Dept. Mgr.; Ben R. Scharrer, Prod. Mgr.; Robert Leach, Supt. 40,000 t. cap.; 8,000 t. stor. 1 mill, 25 t./hr.; 1 shipping unit; 1 basing unit; belt conveyors & hopper system.

CONVERSE

LHPm—Hygro Liquid Fertilizer Corp.
Tel: 166. Robert Ellsworth, Pres.; Lloyd Blaker, Gen. Mgr.; Glenn Harrell, Plant Mgr. 6,000 t. cap.; 90 t. stor.

E. CHICAGO

American Brand Fertilizer Co.
Michigan Ave.—Lake Front Cross-

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
S—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

ing; P. O. Box 3493; tel: 4955. John Greenburg, V.P. Plant at Hobart, Ind.

EVANSVILLE

CDPb—J. A. McCarty Seed Co.
526 N.W. 4th St. (8); tel: 4-2401. J. A. McCarty, Pres.; James A. McCarty, V.P. (sales); Geo. K. Black, V.P. (Purchasing & Production). 1-500 tons.

FORT WAYNE

B—Virginia-Carolina Chemical Corp.
Tel: (ofc) Anthony 3218, (factory) Anthony 5179. (Main ofc: Richmond, Va.)

FOWLER

CaF—Senesac Soil Service
Tel: 185. W. A. Senesac, Pres.; Ralph Puetz, Plant Mgr. 12,000 t. cap.; 5,000 t. stor. Stedman plant equipment.

FRANCESVILLE

CFHP—Gutwein Agricultural Service, Inc.
Tel: 235. Conrad Gutwein, Pres.; Melvin Gutwein, V.P.; Helen Hild, Sec.; Lewis Gutwein, Treas. 9,000 t. cap.; 2,000 t. & 50,000 gal. stor. 1 mill, 25 tons per hr.; 3 upright elevators; 1 hopper weighing system; 1 mixer; 1 pulverizer; 1 screen; 1 conveyor; 2 Payloaders.

GREENSBURG

C—Kova Fertilizer, Inc.
7th and Anderson Sts.; tel: 3-9591. Francis W. Reed, Pres., Treas. & Plant Mgr.; W. Lowell Headlee, V.P.; Marie T. Goddard, Sec. 15,000 tons.

HOBART

C—American Brand Fertilizer Co.
254 Michigan Ave. (ofc: E. Chicago, Ind.) John Greenburg, V.P. & Plant Mgr.

INDIANAPOLIS

SLHP—J. H. Erbrich Products Co.
1120 E. 32nd St. (5); tel: WA 5-6433. John Heidt, Pres.; A. J. Krueger, Sec.-Treas.; Dan Koches, Plant Mgr. 5,000 t. cap.; 2,500 t. stor.

BagP—Indiana Farm Bureau Cooperative Assn., Inc.
47 S. Pennsylvania St. (9); tel: MEL-rose 1-8361. C. E. Moseley, Pres.; Frank Hanna, V.P.; Wm. Kenneth Miller, Treas.; M. R. Bradley, Sec.; Arthur R. Mullin, Fert. Dept. Mgr.; Ben R. Scharrer, Prod. Mgr.; L. M. Leach, Indianapolis Plant Supt.; Walter Weber, Mgr. Pesticide Div. 90,000 t. cap.; 15,000 t. stor. Tractor shovels; 3 shipping units; 1 basing unit; belt conveyors and hopper system. Plants also at Columbia City & Jeffersonville, Ind.

Ba—Kingsbury & Co., Inc.
3001 N. Emerson Ave.; P. O. Box 7107, Brightwood Sta. (18); tel: Liberty 6-2496. Geo. H. Kingsbury, Pres.; Edw. D. Kingsbury, V.P.; James L. Schell, Sec.-Treas.; M. H. Talbott, Supt. 25-30,000 t. cap. storage; 2,500 t. superphosphate, 1,500 t. other raw materials & 4,000 t. mixed goods. 3 mills, 50 t./hr.; hopper systems; conveyors; tractors. Plant also at Peru, Ind.

Bag—E. Rauh & Sons Fertilizer Co.
Indianapolis Stockyards; tel: MEL-rose 4-6491. S. J. Martenet, Pres.;

C. S. Rauh, Board Chmn.; R. D. Martenet, Exec. V.P.; J. J. Weldon, Treas.; H. M. Lee, Sec. Hopper systems; conveyors; tractor shovels. Plants also at Plymouth, Ind. & Sylvania, Ohio.

B—F. S. Royster Guano Co.
W. Raymond St., P. O. Box 802. (Main ofc: Norfolk, Va.) P. H. Keiner, Supt.

B—The Smith Agricultural Chemical Co.
1850 Kentucky Ave. (Main ofc: Columbus, Ohio) Glenn Webber, Supt. 60,000 t. cap.; 45,000 t. stor. Moving 80-ton crane; hoppers; conveyors; tractors.

O—John Wachtel Corp.
700 W. Southern Ave.; tel: GA 4486. John Fox, Pres.; Joseph Loschky, Treas.; Henry Loschky, Plant Mgr. Flight conveyors; Richardson automatic bagging scales; Howell feed mixers; Payloaders. Meat Scrap & tankage plant.

JEFFERSONVILLE

C—Armour Fertilizer Works
14th & Watt Sts.; P. O. Box 448; tel: 2-1301. (Main ofc: Atlanta, Ga.) W. H. Cover, Div. Mgr.

BF—Indiana Farm Bureau Cooperative Assn., Inc.
P. O. Box 149 (New Albany, Ind.); tel: (Indianapolis) MEL-rose 1-8361. (Main ofc: Indianapolis, Ind.) Address all mail to: Arthur R. Mullin, Mgr. Fert. Dept. (Indianapolis); Ralph V. Middaugh, Supt. 40,000 t. cap.; 8,000 t. stor. 1 mill, 25 t./hr.; 2 shipping units; 1 basing unit; conveyors & hopper system; tractor shovels.

E—Shea Chemical Corp.
P. O. Box 326; tel: 2-1381. (Main office) Vincent H. Shea, Pres.; G. H. Gilbertson, V.P.; E. J. Pomerleau, Supt. Fertilizer grade phosphoric acid mfr. Plants also at: Adams, Mass.; Columbia, Tenn.; Dallas, Tex.

KITCHEL

LHP CDK Liquid Fertilizer Corp.
R.F.D. 3, Liberty, Ind.; tel: (Liberty, Ind.) 722-J. E. E. Crouse, Pres.; Ralph Dare, V.P.; E. J. Kruckeberg, Sec.-Treas. 300 t./day; 90 t. stor.

NEW ALBANY

Cag—Davison Chemical Co.—Div. W. R. Grace & Co.
Grant Line Rd.; P. O. Box 350; tel: 5-6671. (Main ofc: Baltimore, Md.) J. L. Gayle, Mgr.

BaPm—Tennessee Corp.
Tel: 5-6641. (Main ofc: New York, N. Y.) R. W. Alexander, Gen. Mgr. 60,000 tons. 3 mills, 40 t./hr.; Hough Payloaders; conveyors.

PERU

Cag—Kingsbury & Co., Inc.
Kelly Ave. at C & O R. R.; P. O. Box 22; tel: 4426. (Main ofc: Indianapolis, Ind.) Ivan Mills, Div. Mgr.; Harvey E. O'Neill, Supt. 35,000 t. cap.; 6,500 t. stor. 2 mills, 60 t./hr.; hopper system; 9 conveyors; 5 tractor shovels; 2 Hysters.

PLEASANT RIDGE

CFPm—Jasper County Farm Bureau Co-Op
Tel: 937-G. (Ofc: Rensselaer, Ind.) Marvin Lvers, Mgr. 10,000 t. cap.; 1,500 t. Stor. Pulverizer; hoppers;

screw conveyor; shuttle belt conveyor; 2 Payloaders.

PLYMOUTH

Ca—E. Rauh & Sons Fertilizer Co.
Western Ave.; P. O. Box 428; tel: 3196, L.D. 16. (Main ofc: Indianapolis, Ind.) L. E. Little, V.P., Prod.; Herman J. Fisher, Plant Mgr. 50,000 t. cap.; 14,000 t. stor. 2 mills, 20 & 40 t./hr.; Sackett hopper system & belt conveyors; Hyster platform trucks; Hough Payloaders.

RENSSELAER

Jasper County Farm Bureau Co-Op
702 N. McKinley Ave.; P. O. Box 238; tel: 660. Arthur E. Arnott, Gen. Mgr.; Lloyd Edrington, Asst. Gen. Mgr.; Marvin Lvers, Mgr. Fert. Dept. Plant: Pleasant Ridge, Ind.

RUSHVILLE

CagF—The Norris Fertilizer Co.
Tel: 3314. (Subsidiary of the Baugh & Sons Co., Baltimore, Md.) K. H. Renegar, Pres.; Benjamin H. Brewster, Jr., V.P.; R. S. Hoffman, Sec.-Treas.; R. Bruce Golightly, Prod. Mgr.

CagF—V. W. Norris & Son, Inc.
130 E. 2nd St.; Box 505; tel: 3117. Alfred C. Norris, Pres.; Kenneth H. Cline, V.P.; Kathryn Norris, Sec.-Treas.; Walker Elliott, Supt. 20,000 t. cap.; 8,000 t. stor. 2 mills, 1 ton; crane; 2 tractor shovels.

SCHERERVILLE

B—Cooperative Plant Foods, Inc.
U. S. Hwy. 41 (1 mi. north of U. S. Hwy. 30); P. O. Box 6; tel: Union 5-2811. Arthur R. Mullin, Pres.; Louis E. Quiram, Sec.-Treas.; Wm. H. Henderson, Plant Mgr. 60,000 t. cap.; 19,000 t. stor. 2 mills, each 30,000 t./yr.; 1 hopper system; 21 conveyors; 8 tractor shovels.

SEYMOUR

Ca—The Buhner Fertilizer Co.
P. O. Box 239; tel: 605. F. F. Buhner, Pres.; C. R. Sparks, V.P. & Gen. Mgr.; E. J. Buhner, Sec.-Treas.; G. H. Smith, Cont. & Asst. Sec.; R. E. Chisham, Plant Mgr.; Ray Vondelingen, Supt. 45,000 t. cap.; 14,000 t. stor. 2 mills, 25 t./hr.; hopper system; conveyors; Payloaders; overhead electric crane; bulk loading facilities. Plant also at Danville, Ill.

WARSAW

LH—Kos-Gro Corp.
502 E. Winona Ave.; tel: 5. Jay Shue, Pres.; Dale Fawley, Plant Mgr. 15 t./hr.

IOWA

CEDAR RAPIDS

Cg—Darling & Co.
P. O. Box 1766; tel: 3-8363. (Main ofc: Chicago, Ill.) Dean Cline, Mgr. 10,000 t. cap.; 2,000 t. stor.

CHARLES CITY

CaPm—Vorhes Chemical Corp.
19th & Kenwood Ave.; P. O. Box 406; tel: 420. R. W. Zastrow, Pres.; H. S. Vorhes, Exec. V.P.; M. J. Klaus, Treas.; F. Robert Kerrigan, Sec. & Supt. 20,000 t. cap.; 8,000 t. stor. 1 mill, 20 t./hr.; hopper systems; belt conveyors; tractor shovels; overhead belt system.

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
a—ammoniate g—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

DES MOINES

CagPm—Iowa Farm Supply Co.
Ofc: 1019 High St.; Plant 200 S.E. 34th St.; P. O. Box 794; tel: 2-8171. (Affiliated with Iowa Farm Bureau Federation: E. Howard Hill, Pres.; Donald B. Groves, Sec.-Treas.) E. O. Johnston, Gen. Mgr.; John Porter, Supt. 70,000 t. cap.; 20,000 t. stor. 3 mills; hopper system; belt conveyors. Plant also at Pocahontas, Iowa.

Cag—National Fertilizer Co.—Div. National By-Products, Inc.
S.E. 20th & Maury; P. O. Box 615; tel: (ofc.) 4-0101, (plant) 6-5139. R. J. Fleming, Pres.; H. M. Ackerly, V.P.; R. W. Retherford, Treas.; Jerry Mitchell, Plant Mgr. 25,000 t. cap.; 15,000 t. stor. 4 mills, 20 t./hr.; hopper systems; conveyors; tractor shovels. Plants also at: Denver, Colo.; Fairbury & S. Sioux City, Nebr.

CFPb—Pioneer Phosphate Co., Inc.
125 S. W. 4th St.; tel: 4-5181. John A. Roberts, Pres., Treas. & Pur. Agt.; Patricia H. Roberts, V.P.; Sumner M. Macomb, V.P., Sec. & Plant Mgr. 7,000 tons. 2 mills, 10 tons per hr.; belt conveyors.

DUBUQUE

B—Virginia-Carolina Chemical Corp.
Tel: 2-3635; factory tel: 2-0786. (Main ofc: Richmond, Va.)

EAGLE GROVE

CagPb—Consumers Cooperative Assn.
Tel: 608. (Main ofc: Kansas City, Mo.) Gordon Hoath, Gen. Mgr. 20,000 t. cap.; 5,500 t. stor. Belt conveyors; granulation equipment; Payloaders.

GRINNELL

CagFPbm—Cornland Plant Foods
230 Park St.; P. O. Box 276; tel: 534. L.D. 3. W. W. Venable & R. E. Sorensen, Ptnrs.; James R. Lincoln, Supt. 36,000 t. cap.; 6,000 t. stor. 2 mills, 25 t./hr.; complete conveyor system; cooler & dryer; Inglett & Corley bagger; elevators; tractor shovels.

HIGHVIEW

CDF—Agricultural Products Corp.
(Ofc: Webster City) Wendell Henderson, Plant Mgr. 15,000 t. cap.; 4,000 t. stor. 2 mills, 1 ton; hopper system; tractor shovels; 275 ft. of conveyors; 3 elevators.

HUMBOLDT

A—The American Agricultural Chemical Co.
P. O. Box 474 (Main ofc: New York, N. Y.) J. J. Doyle, Supt.

LENOX

C—Lenox Fertilizer Corp.
Russell Giles, Pres.; Ralph Zabel, Sec.-Treas.; Raymond C. Bowers, Supt. 25,000 tons, bagged & bulk. (Plant under construction at publication, scheduled for December operation.)

MASON CITY

Aa—International Minerals & Chemical Corp.
810 12th St., N. W.; P. O. Box 1097; tel: (ofc.) 1093, 1094, (plant) 1232.

(Main ofc: Chicago, Ill.) J. W. Hicks, Area Mgr.; J. M. Coates, Dist. Sales Mgr.; Edward P. Ruszat, Supt.
Swift & Co.—Plant Food Div.
P. O. Box 1127; tel: 2727, 2728. (Main ofc: Chicago, Ill.) W. E. Smith, Mgr.

MOUNT PLEASANT

CFPm—Henry County Supply Corp.
Bryon Cary, Pres.; R. K. Earnest, V.P.; Lester McGohon, Sec.-Treas.; Harold Knedler, Gen. Mgr. & Pur. Agt.; Jack Riley, Plant Mgr. 5,000 t. cap.; 6,000 t. stor. 1 mill, 30 tons per hr.; 2 24-ft. elevators; 1 24-ft. belt conveyor; 1 50-ft. belt conveyor; 1 16-ft. screw; 2 hoppers; 1 Hough tractor; 2 elevators; 1 portable elevator.

NEVADA

CFLHPm—Continental Fertilizer Co.
C.R.I. & P. Ry. Oliver Haley, Pres. & Mgr.; Frank Hatcher, V.P.; H. T. Fawcett, Sec.-Treas. 5,000 t. cap.; 500 t. stor. 3 mixers; conveyors; 2 Payloaders; scale; bagging facilities; 6 spreaders. 30,000 gal. anhydrous ammonia storage.

ONAWA

LHPm—Tiger Chemical Co.
Tel: 601. Charles E. Holmes, Pres. & Sec.; Jules D. Holmes, V.P. & Treas.; Floyd Bouslough, Supt.; Everett Foulson, Plant Mgr. 6,000 t. cap.; 600 t. stor.

OTTUMWA

CagF—Super-Crop Plant Foods, Inc.
Milwaukee Roundhouse; P. O. Box 324; tel: MURray 4-4489. J. David Carpenter, Pres.; J. L. Carpenter, V.P.; Donovan Carpenter, Sec.-Treas. 15,000 t. cap.; 7,000 t. stor. 1 mill, hoppers; baggers; conveyors; tractor shovels; fork lift truck; electric conveyor.

PERRY

BagPm—Davison Chemical Co.—Div. W. R. Grace & Co.
N. W. of city; P. O. Box 269; tel: 1270. (Main ofc: Baltimore, Md.) H. E. Clayton, Mgr.

POCAHONTAS

CGPb—Iowa Farm Supply Co.
(Main ofc: Des Moines, Iowa) Roy S. Bondurant, Supt. 15,000 tons.

QUIMBY

CagF—Simonsen Mill Rendering Plant
Tel: 16. Dr. D. W. Simonson (Mgr.) Merle W. Simonsen & E. O. Simonson, Ptnrs.; J. Forrest Thomson, Plant Mgr. 10,000 tons. 2 mills; continuous ammoniator; continuous weigh feeders; 3 tractors.

ROCK RAPIDS

CagEFHPm—Delta Fertilizer, Inc.
Tel: 590. (Ofc: Sioux City, Iowa) Peter Menage, Plant Mgr. 20,000 t. cap.; 5,000 t. stor. 1 mill, 10 t./hr. Worthington mixer; Delta granulating unit; 3 HA Payloaders.

SIOUX CITY

Delta Fertilizer, Inc.
624 Badgerow Bldg. Wally Mitchell, Pres.; H. A. Hindt, V.P.; Tom Vint, Sec. Plant: Rock Rapids, Ia.

CLPb—Nutra Flo Fertilizer Div., Central States Cordage Co.
Grand Ave. & Chambers St.; tel: 5-3925. Royal Lohry, L. W. Lohry,

Kermit Lohry, Ptnrs.; Glenn Winters, Plant Mgr. 30,000 t. cap. (250 t./day); 950 t. stor. Hopper systems; conveyors; pumps, etc.

SPENCER

CagPm—Spencer Plant Foods, Inc.
P. O. Box 328; tel: 2280. Frederick Sherer, Pres.; Ralph Weber, V.P.; John W. Cory, Sec.; R. P. Cloud, Plant Mgr. 25,000 t. cap.; 3,000 t. stor. 1 mill, 15 t./hr.; conveyors; elevators; tractor; valve bagger.

STRAWBERRY POINT

LPI—H. D. Campbell Co.
(Main ofc: Rochelle, Ill.)

WATERLOO

C—Armour Fertilizer Works
P. O. Box 750; tel: Adams 3-8471 & 3-8472. (Main ofc: Atlanta, Ga.) T. C. Ahlgren, Div. Mgr.

Ca—The Rath Packing Co.
Tel: Adams 4-6861. R. A. Rath, Chmn. of Board; Howard H. Rath, Pres.; A. D. Donnell, Exec. V. P.; Cash J. Cahill, Mgr. Feed & Fertilizer Dept. 40,000 tons. 1 mill; conveyors & hopper system throughout plant.

WEBSTER CITY

Agricultural Products Corp.
713 Des Moines St.; tel: 1171 & 1172. C. A. Johnson, Pres.; Karl H. Frantzen, V.P. & Gen. Mgr.; Helen Gruenwald, Sec.-Treas. Plant at Highview, Iowa.

KANSAS

AUGUSTA

S—Soluble Plant Nutrients Co.
Box 388. (Main ofc: Azusa, Calif.) T. J. Johnson, Plant Mgr. 53 tons.

BERN

LH—Schrock Fertilizer Service—Div. Schrock Bros. Co.
C.R.I. & P. R.R. siding. (all materials purchased at main ofc: Congerville, Ill.) 10,000 tons.

CHANUTE

CagPm—Neosho Fertilizer, Inc.
Box 259; tel: 466. Shelton Prospt, Pres.; D. D. Mitchell, V.P.; James F. Cooper, Treas.; Robert Briley, Sec.; Harry E. Davis, Asst. Sec. & Gen. Mgr. 15,000 t. cap.; 5,000 t. stor. 1 mill, 15 t./hr.; 1 hopper system; granulation equipment; dryer; cooler; Bagpacker; mixer; feeder; conveyor; 4 Baughman elevators; 3 Baughman conveyors.

COFFEYVILLE

CaDFPb—Soil-Aid Corp.
125 E. 8th St.; tel: 3390. O. K. Hamlin, Pres.; Lloyd Ford, V.P.; Richard Digby, Sec.-Treas.; Edgar W. Shobe, Dir.; Harry Davis, Dir.; Gerald Pierce, Supt. 4,000 t. cap.; 300 t. stor. 1 mill, 6 t./hr.; tractor; conveyor.

FT. SCOTT

C—Truit's Hydroponic Gardens
408 E. 16th St.; P. O. Box 186; tel: 2183. A. L. Truitt, owner & operator.

HUTCHINSON

CagPm—The Snyder Chemical Co., Inc.
Halstead St.; P. O. Box 383; tel:

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
S—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

MOhawk 2-5479. (Main ofc: Topeka, Kans.) 25,000 tons. 1 basing mill & 1 shipping mill; belt conveyors, hopper systems; continuous ammoniators; dryers; granulators & coolers (all own design).

JUNCTION CITY

CaPm—Kansas Agricultural Chemical Co., Inc.

403 E. 8th St.; Box 293; tel: 8-6157. Harold G. Safrin, Pres., Treas. & Pur. Agt.; Ernest Bauman, V.P.; C. L. Hoover, Sec.; E. J. Mathson, Prod. Mgr. 25,000 t. cap.; 3,000 t. stor. 1 mill (own fabrication); 20 tons per hr. granulation unit; hopper system and conveyors throughout; Payloaders.

KANSAS CITY

BgPm—Farm Belt Fertilizer & Chemical Co.

23rd & State Line; P. O. Box 417. (Kansas City 41, Mo.); tel: DRexel 7485. J. Doyle Patterson, Pres. & Treas.; Vernon B. Kassebaum, Sec.; C. H. Fluty, Gen. Mgr.; M. W. Buzzan, Supt. 35,000 t. cap.; 15,000 t. stor. 3 mills, 40, 25 & 15 t./hr.; granulation unit; dry mix unit.

LAWRENCE

E—Cooperative Farm Chemicals Assn.

P. O. Box 80; tel: 3812. H. A. Cowden, Pres.; D. A. Williams, V.P.; M. R. Miller, Sec.; R. R. Zurbuchen, Gen. Mgr.; Carl C. Chaffee, Supt.; Charles W. Lanning, Prod. Supt. 120,000 t. cap.; 11,000 t. stor. 13,200 tons liquid anhydrous ammonia; 83,000 tons solid ammonium nitrate; 13,200 tons nitrogen solution (40% N₂).

MARYSVILLE

CaGPm—Blue Valley Fertilizer Co., Inc.

P. O. Box 188; tel: 795-796. W. P. Glaspey, Pres.; W. T. Thomson, Sec.-Treas.; Ray Stallbaumer, Supt. 15,000 t. cap.; 3,000 t. stor. 2 mills, 15 & 25 t./hr.; tractors; shovels; conveyors.

OLATHE

Cg—Deep-Root Fertilizers, Inc.

U. S. Hwy. 50 at Frisco R.R. Robert Bentinor, Pres.; Paul Snow, V.P.; W. M. Lehman, Treas.; A. B. Davidson, Plant Mgr. (Plant under construction at publication, scheduled for December operation.)

PITTSBURG

E—Spencer Chemical Co.

(Jayhawk Works) P. O. Box 604. (Main ofc: Kansas City, Mo.) V. F. Hobart, Wks. Mgr. Ammonia; ammonium nitrate liquor; ammonium nitrate; ammonium nitrate ammoniating solutions.

TOPEKA

CaPm—The Snyder Chemical Co., Inc.

Ofc: Room 202 Garlinghouse Bldg.; plant: Norris and North Clay; P. O. Box 946; tel: 5-2353. Jack B. Snyder, Pres. & Treas.; Leon F. Baker, Jr., V. P. & Gen. Mgr.; Ruth C. Dixon, Sec.; John Lampe, Supt. 25,000 tons. 1 basing mill & 1 shipping mill; belt conveyors; hopper systems; continuous ammoniators; dryers; granulators & coolers (all

own design). Plant also at Hutchinson, Kans.

WICHITA

O—Kansas-Nebraska Fertilizer Co.

Room 20, Livestock Exchange Bldg. (2); tel: AM 2-0411. Conlee Smith, Pres. & Gen. Mgr.; Len Bouray, V.P. & Treas.; Dan Smith III, Asst. Gen. Mgr.; H. S. Pottle, Sec.; Lucian Haley, Supt. 3,500 t. cap.; 1,000 t. stor.

CaG—Wichita Fertilizers, Inc.

2728 Ohio; P. O. Box 2337; tel: AMherst 7-1206. Bernard L. Thompson, Pres.; Herman R. Sutherland, V.P.; Vernon Kassebaum, Sec.; J. Doyle Patterson, Treas.; Harry A. Edmonds, Supt. 25,000 t. cap.; 6,000 t. stor. 1 mill, 15 t./hr.

KENTUCKY

CYNTHIANA

CaFPm—Bluegrass Plant Foods, Inc.

Main & Lincoln; P. O. Box 310; tel: 616, 617. Osmer S. Deming, Pres.; Gen Van Deren, V.P. & Treas.; A. M. Van Deren, Sec.; W. C. Curry, Jr., Supt. 20,000 tons. 1 mill, 1½ tons; hopper systems; conveyors; tractor shovels. Plant also at Danville, Ky.

DANVILLE

BaFPm—Bluegrass Plant Foods, Inc.

Boxdahl Dr.; P. O. Box 65; tel: 2626, 2627. (Main ofc: Cynthiana, Ky.) W. C. Curry, Jr., Supt. 25,000 tons. 2 mills, 1 ton; hopper systems; conveyors; tractor shovels.

HENDERSON

E—Spencer Chemical Co.

P. O. Box 278. (Main ofc: Kansas City, Mo.) R. D. Wallace, Wks. Mgr. Ammonia, ammonium nitrate liquor, ammonium nitrate ammoniating solutions.

CgF—Tri-State Chemical Co.

5th & Priest St.; P. O. Box 123; tel: 2996, 7-1682. John W. Manning, Pres.; Elmer D. Young, V.P. & Treas.; R. E. Butler, Jr., Sec.; Alton Dickerson, Plant Mgr. 20,000 t. cap.; 5,000 t. stor. Complete hopper systems; conveyors; Payloaders; unloading elevators & conveyors; open mouth bagging equipment.

HOPKINSVILLE

C—Virginia-Carolina Chemical Corp.

Tel: TU 6-1291, (factory) TU 6-1292. (Main ofc: Richmond, Va.)

LEXINGTON

CF—Burley-Belt Plant Food Works

R.F.D. 4; tel: 4-4888. A. N. Peck, (Pur. Agt.) & R. F. Terhune, Ptnrs. M. E. Haney, Plant Mgr. 22,000 t. cap.; 9,000 t. stor. 1 mill, 1 t. cap.; 2 conveyor belts; 3 tractor shovels; St. Regis automatic bagger; bulk loading facilities.

LONDON

Ba—Knoxville Fertilizer Co.

Warehouse St.; P. O. Box 274; tel: 252. (Main ofc: Knoxville, Tenn.) Barney A. Tucker, Plant Mgr. 35,000 t. cap.; 12,000 t. stor. 2 mills, (phosphate) 20 t./hr.; (mix) 40 t./hr.; hopper system; crane; Payloaders; conveyors.

LOUISVILLE

Ca—Cooperative Fertilizer Service

of Richmond, Inc.

Grade Lane; P. O. Box 65, Camp Taylor Sta.; tel: ATwood 6537. (Main ofc: Richmond, Va.) R. A. Allgood, Plant Mgr. 40,000 tons mixed fertilizer. 2 mills, 175 t./day. Complete hopper system; belt conveyors throughout plant; chain drag conveyor for unloading; 6 tractor shovels.

Ca—Federal Chemical Co.

General Office, 646 Starks Bldg. (2); plant: 1400 S. Hancock (17); tel: JACKson 8331. John V. Collis, Pres.; J. D. Stewart, Jr., Exec. V.P.; George W. Shields, V.P. & Comptroller; J. R. Sargent, V.P.; Sam E. Shelby, V.P.; W. Q. Harned, Treas.; F. H. Courtney, Sec.; R. M. Shehan, Asst. Treas.; Clark L. Kelly, Jr., Asst. Treas.; Theo M. Dues, Louisville Div. Sales Mgr.; Joe McGuire, Louisville Plant Mgr. Plants also at: Danville, Ill.; Butler Ind.; Columbus, Ohio; Humbolt & Nashville, Tenn.

Ca—North American Fertilizers Co., Inc.

Preston & Bergman Sts.; tel: MAGnolia 3180. Walter Crady, Pres.; E. F. Crady, Exec. V.P.; R. W. Conlee, V.P.; E. H. Schueler, Sec.-Treas.; Tom C. Bowser, Supt. 50,000 t. cap.; 15,000 t. stor. 4 mills, 20-25 t./hr.; Payloaders, etc.

E*—North American Phosphate Co.

Tel: MAGnolia 0872. T. W. Cardy, Pres. & Gen. Mgr.; Arthur Beard, V.P.; A. C. Alt, Sec.-Treas.; F. O. Faith, Plant Supt. Mfg. superphosphate only. 50,000 tons.

C—Price Chemical Co.

Miller's Lane; tel: ARLington 5736. John A. Miller, Pres.; W. M. Newman, Sec.-Treas.; Ralph E. Smith, Plant Mgr. 40,000 tons. 1 bagging mill, 40 tons per hr.; St. Regis valve packer; automatic basing system; 6 hoppers electrically controlled; system of belt conveyors.

MAYSVILLE

CaFPm—Ohio Valley Fertilizer Corp.

Mason-Lewis Rd.; P. O. Box 799; tel: LO 4-5950. Douglas McLoney, Pres.; Herbert Moore, V.P.; G. R. Nooe, Treas. & Gen. Mgr.; C. M. Tomlin, Sec.; Joseph Marsh, Plant Mgr. 15-20,000 t. cap.; 10,000 t. stor. 1 mill; 3 Payloaders; 2 conveyors; 1 complete mill & valve packer.

MURRAY

CaFPm—Hutson Chemical Co.

Railroad Ave.; Mailing Address: 709 Olive St.; tel: 86. Dan C. Hutson & N. P. Hutson. 4,000 t. cap.; 1,200 t. stor. 1 mill, 10 t./hr.

OWENSBORO

CaFPb—Bartlett & O'Bryan Fertilizer Co.

108 River Road; tel: 4-1983. T. J. Bartlett & Wm. M. O'Bryan, Owners; T. J. Bartlett, Supt.; Russell Rowland, Mgr. Pesticide Div. 15,000 t. cap.; 7,000 t. stor. 1 mill, 20 t./hr.; conveyors; power shovels; hopper system.

RUSSELLVILLE

BaFPbm—Commonwealth Fertilizer Co., Inc.

Morgantown Rd.; P. O. Box 388; tel: 722, 723. Nat H. Love, Pres., Pur. Agt., Plant Mgr., & Mgr. Pesticide Div.; J. A. Hicks, V.P. 20,000 t. cap.; 10,000 t. stor. 1 mill, 25 t./hr.; hop-

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
a—ammoniate **g**—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

per system; continuous superphosphate system; overhead conveyors; & 4 Payloader; tractor shovels.

SOMERSET

Ca—International Minerals & Chemical Corp.
 P. O. Box 658; tel: 920. (Main ofc: Chicago, Ill.) H. C. Godsey, Supt.

WINCHESTER

Ba—Cooperative Fertilizer Service, Inc. of Richmond, Va.
 Magnolia St.; P. O. Box 103; tel: 121. (Main ofc: Richmond, Va.) Gene W. Cecil, Plant Mgr.; A. P. Sale, Jr., Mgr. 20,000 t. cap.; 4,000 t. stor. 2 mills (batching & shipping) 175 t./day each; 4 tractor shovels.

CaF—Kentucky Fertilizer Works
 222 E. Cash Ave., P. O. Box 22; tel: 161, 206. J. B. McConnaughey, Owner & Plant Mgr.; B. M. Dickerson, Asst. Plant Mgr. 20,000 t. cap.; storage: (materials) 1,000 t. (phosphate) 1000 t., (mixed goods) 4,500 t. 2 mills, 1 & 1/2 tons; 4 elevators; shuttle conveyors; 3 tractor shovels; automatic scale with sewing heads & conveyor; St. Regis Valve Pack shipping mill; blending equipment.

LOUISIANA

ARCADIA

CaP—Arcadia Cotton Oil Co., Inc.
 108 A. Beech; tel: 2041, 2042. R. L. Taylor, Pres.; G. C. Taylor, V.P.; Jack T. Taylor, Sec.; R. L. Taylor, Jr., Treas. 15,000 t. cap.; 4,000 t. stor. 1 mill, 1 t. cap.; belt conveyors; 3 Payloaders.

BATON ROUGE

E—Consolidated Chemical Industries, Inc.
 (Sou. Div. ofc: Houston, Tex.) W. J. Daspl, Plant Mgr. Sulphuric acid, bone meal plant.

BGPf—Louisiana Agricultural Supply Co., Inc.
 Box 843. W. F. Williamson, Sr., Pres. & Pur. Agt.; E. L. Bruner, V.P.; W. F. Williamson, Jr., Treas. & Mgr. Pesticide Div.; W. S. Slaughter, Sec.; G. M. Slaughter, Plant Mgr.

C—Dixie Fertilizer Co., Inc.
 402 Hamilton Rd.; Mailing Address: P. O. Box 1111, Shreveport, La.; tel: 3-7179. Stanley M. Hackett, Pres.; Mrs. Georgie H. Chandler, V.P. & Treas.; Mrs. Louise C. Foreman, Sec.; D. F. Wallace, Supt. 50,000 t. cap.; 20,000 t. stor. 3 mills, 400 t. cap.; conveyors; tractor shovels.

BUNKIE

E—Bunkie Phosphate Co.
 (Subsidiary of Guaranty Seed Co., Bunkie, La.) Superphosphate plant. 15,000 t. cap.; 2,000 t. stor. Funnel type mixer; conveyors.

CF—Guaranty Seed Co.

P. O. Box 96; tel: 2661. Roy J. Fontane, Pres.; Charles Fontane, V.P.; R. K. Ogdon, Sec.-Treas.; A. Armand, Plant Mgr. 10,000 tons. 1 mill; batch hopper system; conveyors.

EUNICE

Ca—Kelly Weber & Co., Inc.
 Box 111; tel: 2251. (Main ofc: Lake Charles, La.) S. P. Rozas, Plant

Mgr. 20,000 t. cap.; 10,000 t. stor. 1 mill, 25 t./day; 2 tractor shovels, overhead conveying system.

LHPm—"Pronto" Liquid Fertilizer Corp.

433 N. 1st St.; P. O. Box 288; tel: 2291. I. Edward Uzzo, Pres. & Mgr.; Phillip Uzzo, V. P. & Treas.; Francis S. Muffoletto, Sec.

FRANKLINTON

BaF—Green & Reedy

Frank Reedy & Chester Green, Ptnrs.; Hermon Thomas, Plant Mgr. 20,000 t. cap.; 9,600 t. stor. 1 mill, 7 1/2 t./hr.; 60-ton 6 compartment hopper; 5 24-in belt conveyors; 3 Payloaders; continuous den; fork lifts.

GRETNA

Cag—Davison Chemical Co.—Div. W. R. Grace & Co.
 First & Amelia Sts.; P. O. Box 107; tel: F0rest 6-3284. (Main ofc: Baltimore, Md.) E. M. Harold, Mgr.

HARVEY

A—Swift & Co.—Plant Food Div.
 P. O. Box 158; tel: FILLmore 1-5262 & 1-5335. (Main ofc: Chicago, Ill.) Austin Cook, Mgr.

LAKE CHARLES

Bag—Kelly Weber & Co., Inc.
 415 Ann St.; P. O. Box 870; tel: HE 9-2366. Arthur L. Gayle, Pres. & Gen. Mgr.; Voris King, V.P.; W. Gedge Gayle, Gen. Mgr. Fert. Dept. & Pur. Agt.; Jack D. Robinson, Supt. Fert. Dept.; Charles T. Odum, Fert. Plant Ofc. Mgr. 25,000 t. cap.; 10,000 t. stor. 2 mills, 20 t./hr. Overhead conveying system; 6-cluster hopper; 7 tractors.

CD—Lake Charles Feed Co., Inc.
 Ofc: 501 N. Louisiana, plant 1410 1st St.; P. O. Box 419; tel: HE 9-2634. A. L. Gayle, Pres.; A. O. King, V.P.; F. J. Vincent, Sec.-Treas.; S. B. Parry, Mgr.; Roy Emmons, Mgr. Fert. Dept. 10,000 t. cap.; 5,000 t. stor. 1 mill; hopper system; conveyor; 2 tractors.

LULING

E—Lion Oil Co.
 (Barton Plant) P. O. Box 174; tel: 2911. (Main ofc: El Dorado, Ark.) R. L. Van Zandt, Supt. 127,750 t. cap. (ammonia); 5,200 t. stor. Anhydrous ammonia; aqua ammonia; nitrogen fertilizer solutions; pelletized ammonium nitrate.

MINDEN

CaPbm—Minden Cotton Oil & Ice Co., Ltd.
 Shreveport Rd.; P. O. Box 928; tel: 80, 88. J. B. Snell, Pres. & Mgr.; R. L. Taylor, V.P.; E. L. Lyon, Sec.-Treas. & Mgr. Pest. Div.; R. D. Miller, Plant Supt. 15,000 t. cap.; 8,000 t. stor. 1 mill, 1 ton; 3 Payloaders.

NEW ORLEANS

A—Armour Fertilizer Works
 Shrewsbury Rd.; P. O. Box 10218; tel: TE 4649 & 4640. (Main ofc: Atlanta, Ga.) C. S. Livingston, Div. Mgr.

The Southern Cotton Oil Co.
 General offices. 1701 National Bank of Commerce Bldg. 210 Baronne St.; tel: MA 4161. A. Q. Petersen, Pres.; M. W. Lyons, L. C. Haskell, (Savannah, Ga.) E. A. Geoghegan, V.P.'s; W. F. Hoerner, Sec.; C. M.

Carriere, Treas. Plants at: Birmingham, Decatur & Montgomery, Ala.; Little Rock, Ark.; Pensacola, Fla.; Cartersville, Cordele, Dublin, Ft. Gaines, Macon, McRae & Warrenton, Ga.; Davidson, Gibson, Goldsboro, Rocky Mount, Shelby & Wilson, N. C.; Florence, Laurens & Spartanburg, S. C.

OPELOUSAS

CD*—Farm Service, Inc.
 P. O. Box 271. J. W. Anthony, Pres.; John Wood Anthony & W. H. Anthony, V.P.'s; E. B. Anthony, Sec.-Treas.; Allen Richard, Plant Mgr. 25,000 tons.

RUSTON

C—Ruston Oil Mill & Fertilizer Co.
 312 W. Louisiana; P. O. Box 384; tel: 141. L. W. Ott, Pres.; Everett R. Scott, V.P.; Roy Cook, Sec., Pur. Agt. & Mgr.; J. W. Thompson, Supt. 7,000 t. cap.; 3,000 t. stor. 1 mill, 1 ton; 4 belt conveyors; 2 Payloaders.

SHREVEPORT

Dixie Fertilizer Co., Inc.
 P. O. Box 1111. S. M. Hackett, Pres. & Pur. Agt.; Mrs. Georgie H. Chandler, V.P. & Treas.; Mrs. Louise C. Foreman, Sec.; D. W. Wallace, Plant Mgr. Plant at Baton Rouge, La.

B*—Shreveport Fertilizer Works
 Future plant operation uncertain at time of publication.

P. O. Box 1. Staunton B. Sample, V.P.; Ira E. Moss, Sec.-Treas.; Herman Cain, Plant Mgr. 75,000 tons. 4 mixing machines (1,000 tons, 10 hrs.); 1 hopper; 6 belt conveyors.

B—Swift & Co.—Plant Food Div.
 Bell St.; P. O. Box 3567, Queensboro Sta.; tel: 2-7191. (Main ofc: Chicago, Ill.) W. L. Gray, Mgr.

A—Virginia-Carolina Chemical Corp.
 Tel: 3-6274; factory tel: 4-1396. (Main ofc: Richmond, Va.)

MAINE

BOWDOINHAM

CaPpm—Sagadahoc Fertilizer Co., Inc.
 Tel: MOhawk 6-2401. J. E. Totman, Pres.; Wm. A. Fessler, V.P.; A. M. Fides, Treas. & Gen. Mgr.; F. P. Preti, Clerk; Byron Durgin, Asst. Mgr. 15,000 t. cap.; 13,000 t. stor. 2 mills, 25 t./hr.; conveyors; tractor shovels.

CARIBOU

CP—Aroostook Federation of Farmers
 22 Sweeden St. P. J. Sullivan, Gen. Mgr.; Byron E. Hand, Mgr. Pesticide Div. 25,000 tons. Plants also at: Fort Kent & Sherman, Me.

FORT KENT

CP—Aroostook Federation of Farmers
 (Main ofc: Caribou, Me.) 20,000 tons.

C—Economy Fertilizer Co., Inc.
 Market St.; tel: 326-22. Bryon A. Young, Pres. & Plant Mgr.; Norman A. Guy, Sec.-Treas. 1,500 t. cap.; 200 t. stor.

HOULTON

Ca—International Minerals & Chem-

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
S—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

ical Corp.

Bangor St.; P. O. Box 632; tel: 2223, 2224. (Main ofc: Chicago, Ill.) M. L. Bruce, Supt.

C—The Summers Fertilizer Co., Inc.

P. O. Box 187; tel: 3481. (Main ofc: Baltimore, Md.) Victor S. Totman, Mgr.; Tom Scott, Supt. 5,000 t. cap.; 5,000 t. stor. 1 mill, 30 t./hr.; conveyors; tractor shovels, etc.

MARS HILL

C—The Summers Fertilizer Co., Inc.

Tel: 3711. (Main ofc: Baltimore, Md.) M. J. Dickinson, Mgr. 5,000 t. cap.; 5,000 t. stor. 1 mill, 30 t./hr.; conveyors, tractor shovels, etc.

PORTLAND

CLPm—Portland Rendering Co.

147 Presumpscot St.; P. O. Box 1359; tel: 3-3834. (Main ofc: Consolidated Rendering Co., Boston, Mass.) R. I. Scherer, Plant Mgr. 5,000 t. cap.; 6,000 t. stor. 1 mill, 1 t.; 2 Payloaders; 1 overhead shovel.

PRESQUE ISLE

C—Armour Fertilizer Works

443 Main St.; P. O. Box 789; tel: 5741, 5751. (Main ofc: Atlanta, Ga.) H. H. Kirk, Div Mgr.

C—Aroostook Hi-Test Fertilizer Co.

422 Main St.; tel: 5261. T. R. York, Pres.; A. J. Beck, V.P.; D. F. Cliff, Treas. & Gen. Mgr.; John J. Edmunds, Sec.; W. R. Edgecomb, Prod. Mgr.; G. N. Currie, Plant Mgr. 20,000 tons.

D—Higgins Formulas Co.

83 A. Dudley St.; tel: 9-1931. A. W. Higgins, R. F. Thomas, R. A. Higgins, Owners.

Ca—Shur-Gain, Inc.

409 Main St.; Box 848; tel: 5791. (Subsidiary of Canada Packers Ltd., Toronto, Ont., Can.) K. H. Larsen, Mgr.; G. J. Brinkman, Supt. 10,000 t. cap.; 10,000 t. stor. 1 mill, 30 t./hr.; 1 belt conveyor; 2 Payloaders.

SANDY POINT (STOCKTON)

Cag—The Summers Fertilizer Co., Inc.

Tel: Searsport 141. (Main ofc: Baltimore, Md.) F. L. Litty, V.P. & Gen. Mgr. 50,000 t. cap.; 30,000 t. stor. 2 mills, 50 t./hr.; hopper systems; conveyors; tractor shovels, etc.

SEARSPORT

C—The American Agricultural Chemical Co.

Tel: Searsport 52. (Main ofc: New York, N. Y.) T. A. Bayley, Supt.

E—Northern Chemical Industries, Inc.

Tel: 141. (Main ofc: Baltimore, Md.) F. L. Litty, V.P. & Gen. Mgr.; J. G. Moynihan, Asst. Mgr.; D. K. Cooper, Pur. Agt. 200,000 t. cap.; 80,000 t. stor. Conveyors; tractor shovels, etc.

SHERMAN

CP—Aroostook Federation of Farmers

(Main ofc: Caribou, Me.) 15,000 tons.

MARYLAND

BALTIMORE

A—The American Agricultural Chemical Co.

2272 S. Clinton St.; tel: BRoadway 8100. (Main ofc: New York, N. Y.) R. L. Waring, Jr., Mgr.; R. M. Rich-ey, Supt.

C—Armour Fertilizer Works

Curtis Bay; P. O. Drawer 304 (26); tel: CUrtis 7-3000. (Main ofc: Atlanta, Ga.) L. J. Mitchell, Div. Mgr.

As—The Baugh Chemical Co.

Ofc: 25 S. Calvert St. (2); Plant: Foot of Clinton St.; tel: PLaza 2-6500. B. H. Brewster, Chmn. of Board; P. J. Prosser, Pres.; Herman Williams, P. W. Sinwell, L. A. Krebs, P. J. Prosser, Jr., Dorothy Q. Harper, V.P.'s; Benjamin H. Brewster, Jr., Exec. V.P. & Treas.; R. S. Hoffman, V.P., Sec. & Comptroller; A. T. Hoch, Supt.

CaF—The Baugh & Sons Co.

General Office. 25 S. Calvert St. (2). B. H. Brewster, Chmn. of Board; P. J. Prosser, Pres.; Herman Williams, P. W. Sinwell, L. A. Krebs, P. J. Prosser, Jr., Dorothy Q. Harper, V.P.'s; Benjamin H. Brewster, Jr., Exec. V.P. & Treas.; R. S. Hoffman, V.P., Sec. & Comptroller; A. T. Hoch, Supt.

Ca—Cooperative Fertilizers Service of Baltimore, Inc.

Box 303, Curtis Bay Sta. (26); tel: PRospect 0843. H. A. Hanemann, Pres.; W. T. Steele, Jr., V.P.; A. P. Sale, Jr., Exec. V.P.; K. R. Eckles, Treas.; Jas. R. Ayers, Jr., Sec.; O. P. Bernhardt, Jr., Mgr.; A. E. Beall, Supt. 100,000 t. cap.; 30,000 t. stor. 3 shipping mills, 35 t./hr. each; cranes; hopper batching; shovels; valve packers; conveyors.

Davison Chemical Co.—Div. W. R. Grace & Co.

101 N. Charles St. (3); tel: SAratoga 7-3900. General Offices. C. F. Hockley, Chmn. Advisory Board; M. G. Geiger, Pres.; W. E. McGuirk, Jr., Exec. V.P.; R. W. Bachman, V.P.—Research & Devel.; D. N. Hausenman, V.P.—Mktg.; F. C. Nicholson, V.P.—Chem. oper.; M. C. Roop, V.P.—Fin. & Sec.; C. E. Waring, V.P.; W. N. Watmough, Jr., V.P.—Mixed Fert. Oper.; J. S. Marks, Treas.; F. J. Griffin, Cont. Plants at: Bartow, Ft. Pierce & Jacksonville, Fla.; New Albany, Ind.; Perry, Iowa; Gretna, La.; Curtis Bay, Md.; Lansing, Mich.; Joplin, & Trenton, Mo.; Wilmington, N. C.; Alliance, Columbus, & Findlay, Ohio; Tulsa, Okla.; Charleston & Spartanburg, S. C.; Nashville, Tenn. Plants at: Curtis Bay, Md.; Alliance, Cincinnati & Columbus, Ohio; Nashville, Tenn.; Lansing, Mich.; Gretna & Lake Charles, La.; Perry, Iowa; New Albany, Ind.; Bartow, Fla.

Bag—Fertilizer Manufacturing Co-operative, Inc.

1800 S. Clinton St. (24); tel: ORleans 5-7120. J. C. Crissey, Pres.; A. P. Sale, Jr., V.P.; A. M. Eno, Sec. Treas.; George Dietz, Ofc. Mgr.; Marion Ingram, Traffic Mgr.; Albert Spillman, Mgr.; Harry L. Fader, Supt. 70,000 t. cap.; 20,000 t. stor. 4 mills; mixing mill 40 tons; 3 shipping mills, 30 tons each; cranes; belt conveyors; overhead cars and overhead hoppers for mixing and shipping.

CagPm—Griffith & Boyd Co.

Ofc: 210 E. Redwood St. (2); plant: Foot of Andre St., Locust Point; tel: PLaza 2-4650. James E. Totman, Pres.; George A. Biddison, V.P.; N. K. Totman, Treas.; Wm. A. Fessler, Sec.; Wm. B. Bird, Plant Mgr. 50,000 t. cap.; 30,000 t. stor. 3 mills, 30-40 t./hr. each; hopper system; belt conveyors; Payloaders; shovels, etc.

SCPl—Hy-Gro Corp.

1101 Maryland Ave. (1). David H. Fulton, Jr., Pres.; Edward A. Hartman, V.P.; F. Jackson Andrews, 2nd V.P.; Gordon C. Murray, Sec.; W. James Price, IV, Treas. (Formerly: Agricultural Div., McCormick & Co., Inc.)

CaFPi—Miller Chemical & Fertilizer Corp.

2226 N. Howard St. (18); tel: TUXedo 9-9692. W. Newton Long, Pres.; Thos. L. Smith & O. Neuman, Jr., V.P.'s; L. W. Cameron, Treas.; J. F. Miller, Sec.; A. G. Fischer, V.P. & Supt. 15,000 tons. Conveyors; tractor shovels, etc. Plants also at Gaithersburg, & Whiteford, Md.; Hanover, Pa.

Northern Chemical Industries, Inc.

Main ofc: Totman Bldg., 210 E. Redwood St. (2); tel: SAratoga 7-6303. J. E. Totman, Pres.; R. E. Fraser, C. LeR. Carpenter, J. C. Totman & F. L. Litty (Plant Mgr.), V.P.'s; Wm. A. Fessler, Sec.; N. K. Totman, Treas. Plant at Searsport, Maine.

Aa—Olin Mathieson Chemical Corp.—Eastern Fertilizer Div.

Ofc: Mathieson Bldg. (3); Plant: Curtis Ave. & Aspen St. J. H. Nason, Gen. Mgr.; R. H. Hodgson, Mgr. Retail Sales; D. T. Fangmeyer, Mgr. Wholesale Sales; Dr. M. E. Miller, Mgr. Oper.; Dr. A. M. Smith, Ag. Dir.

SCg—Plantabbs Corp.

1105 Maryland Ave. (1); tel: MU 5-3313. V. McC. Fulton, Pres.; D. H. Fulton, Jr., V.P. & Plant Mgr.; V. C. Tietz, Treas.; E. F. Casey, Sec. Mfg. mixed fert. in tablet form.

A—F. S. Royster Guano Co.

2001 Chesapeake St. (Main ofc: Norfolk, Va.) E. N. Lacy, Supt.

AagPm—The Summers Fertilizer Co., Inc.

Main ofc: Totman Bldg., 210 E. Redwood St. (2); tel: SAratoga 7-3860. J. E. Totman, Pres.; Wm. A. Fessler, R. E. Fraser, F. L. Litty, C. L. Carpenter, V.P.'s; N. K. Totman, Treas.; D. C. Zaiser, Sec.; J. C. Totman, Asst. Treas.; R. L. Merritt, Asst. Sec.; C. M. Wallace, Export Mgr.; Wm. B. Bird, Baltimore Plant Mgr. Baltimore: 100,000 t. cap.; 25,000 t. stor. 3 mills, 25 t./hr. Hopper systems; conveyors; tractor shovels, etc. Plants also at: Houlton, Mars Hill & Sandy Point, Me.; Grand Forks, N. D.; McKeesport, Pa.; Sioux Falls, S. D. and St. Stephen, N. B., Canada.

C—Swift & Co.—Plant Food Div.

Curtis Bay (26); tel: CUrtis 7-2306. (Main ofc: Chicago, Ill.) A. W. Langdon, Mgr.

C—Virginia-Carolina Chemical Corp.

Tel: 9-1950; Factory tel: CUrtis 7-0092. (Main ofc: Richmond, Va.)

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. mixed fertilizers
a—granulate g—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

CAMBRIDGE

CaFHPb—Dorchester Fertilizer Co.
P. O. Box 28; tel: 69 Enos Valliant, Chmn. of Board; George P. Lippincott, Pres.; A. K. Austin, V.P.; John S. Neild, Jr., Sec.-Treas.; Seward Mende, Plant Mgr. 20,000 t. cap.; 10,000 t. stor. 4 mills, 30 t./hr.; conveyors; tractor shovels; fork lifts.

CENTREVILLE

CaF—E. S. Valliant & Son, Inc.
E. Stephens Valliant, Pres.; E. S. Valliant, Jr., V.P. & Treas.; James W. Valliant, Sec.; J. M. Hodgson, Plant Mgr. 12,000 t. cap.; 5,000 t. stor. 3 mills; conveyor system; tractor shovels; Yale fork truck & pallets; Inglett & Corley bag packer; bag conveyors into trucks.

CHESTERTOWN

CaF—Peerless Fertilizer Co., Inc.
Tel: 670. James R. Sell, Mgr. 8,000 tons.

CHEWSVILLE

C—Chewsville Co-Operative Assn., Inc.
Tel: (Hagerstown) 3121. John A. Martin, Pres.; Robert L. Hartle, V.P.; A. Romayne Miller, Sec.; G. Wm. Gardenhour, Treas.; Clarence C. Frey, Plant Mgr. 2,000 tons. Sackett mixer & elevator; tractor.

CURTIS BAY

Agg—Davison Chemical Co.—Div. W. R. Grace & Co.
Tel: CURtis 7-1900. (Main ofc: Baltimore, Md.) A. R. Worrall, Wks. Mgr.

DENTON

CFH—Soil Service
Greensboro Rd.; P. O. Box 362; tel: 322. Walter B. Palmer, Sr., Owner & Operator; Walter B. Palmer, Jr., Plant Mgr. 2,000 t. cap.; 500 t. stor. 2 belt conveyors; 2 bucket legs; 1 receiving hopper & auger.

FREDERICK

CaFP—Ramsburg Fertilizer Co.
S. Carroll St.; P. O. Box 317; tel: MO 3-9311. J. Richard Ramsburg, Pres. & Treas.; Roger Lenbart, Supt. 10,000 t. cap.; 5,000 t. stor. 1 mill, 1 ton; 2 belt conveyors.

FULLERTON

C—The Organic Development Co.
9301 Belair Rd.; tel: Northfield 5-3366. J. A. Johnson, Pres. 10,000 t. cap.; 500 t. stor. Mixers; conveyors; hoppers, etc.

GAITHERSBURG

C—Miller Chemical & Fertilizer Corp.
(Main ofc: Baltimore, Md.) 15,000 tons. Mills; belt conveyors; tractor shovels.

HAGERSTOWN

BaFPfm—Central Chemical Corp.
P. O. Box 310; tel: 4700. Franklin M. Thomas, Pres.; M. C. Morton, V.P.; F. S. Schwartz, Treas.; G. G. Thomas, Sec.; Charles D. Fogg, Supt.; D. Fred Neikirk, Pur. Agt.; Sam Marshall, Mgr. Pesticide Div. 50,000 t. cap.; 20,000 t. stor. 4 mills, 10,000 t./yr. each; hopper system; conveyors; tractor shovels. Plants also at: Butler, Everett, Gettysburg & Milton, Pa.; Harrisburg & Crimora, Va.

HAMPSTEAD

CFP—Hampstead Fertilizer Co.
Tel: 4061. J. M. Simmons, Pres.; Robt. W. Royston, V.P.; M. M. Rohrbaugh, Sec.; H. L. Twigg, Treas. & Plant Mgr.; J. F. Getty, Mgr. Pest. Div. 2,000 t. cap.; 600 t. stor. 1 mill, 1 ton; hopper; belt conveyors (hand made in plant).

KEYMAR

CaF—The Frederick Mehring Fertilizer Works, Inc.
Tel: Union Bridge 4774. H. O. Harner V.P. & Mgr. 10,000 tons.

LANDOVER

CagFPm—F. W. Belgiano & Co.
1701 Cabin Branch Rd., S. E. (Office at Washington, D. C.) W. H. Cockerell, Plant Mgr. 8,000 t. cap.; 3,000 t. stor. 1 mill, 1 ton; unloading elevator; bagging elevator; valve packer; stationary & shuttle conveyors; Hough Payloader; Yale & Towne scoop shovel.

POCOMOKE CITY

CFGHPb—W. B. Tilghman Co.
Tel: 222. (Main ofc: Salisbury, Md.) R. A. Ross, V.P.; Russell Malone, Plant Mgr. 20,000 tons.

SALISBURY

CaF—The Farmer & Planters Co.
202 Mill St.; tel: 7151. W. Lee Allen, Pres.; J. Wm. Shockley, V.P.; Edgar H. McGrath, Sec.-Treas. 10,000 t. cap.; 6,500 t. stor. 1 mill, 30 t./hr.; conveyors; tractor shovels; crane.

CFGHPbm—Wm. B. Tilghman Co., Inc.
Wm. B. Tilghman, Jr., Pres.; Mrs. Louise T. Lambert & R. A. Ross, (Pocomoke City) V.P.'s; John L. Morris, Sec.-Treas.; F. N. Struwick, Asst. Sec.-Treas.; E. H. Smith, Sales Mgr.; Harvey Campbell, Plant Mgr. 20,000 t. cap.; 10,000 t. stor. Complete mechanized handling equipment. Plant also at: Pocomoke City, Md.

SNOW HILL

CaFGHPbm—The Worcester Fertilizer Co.
Ralph E. Schockley, Pres.; R. Newell Stagg, V.P.; Ben T. Truitt, Sec.-Treas. & Mgr.; Miss M. L. Truitt, Asst. Sec.-Treas.; Daniel S. Moore, Asst. Sec.-Treas.; Levi J. Truitt, Plant Mgr. 20,000 t. cap.; 5,000 t. stor. 1 mill; 1 ton mixer; hopper system; chain conveyors; Valve-Pak bagging set up; 3 Payloaders; fork lift; crane.

WESTMINSTER

CaFP—Farmers Fertilizer & Feed Co.
1 W. Main St.; tel: 290. Jno. E. B. Nelson, V.P.; Jno. P. W. Beard, Treas. & Pur. Agt.; Paul R. Niswander, Sec.; Geo. Devilbiss, Plant Mgr. 15,000 t. cap.; 8,000 t. stor. 1 mill, 35 t./hr.; 2 front end loaders; 2 conveyor belts; sewing machine.

CF—Westminster Fertilizer Co.
Green St. Bridge; tel: 180. John E. Stevenson, Pres.; Geo. M. Tracy, V.P.; V. C. Hull, Sec.-Treas.; E. L. Crowl, Exec. V.P. & Plant Mgr. 2,000 tons. 1 mill; hopper system.

WHITEFORD

CLP—Miller Chemical & Fertilizer Corp.
Tel: CARDiff 16. (Main ofc: Balti-

more, Md.) A. G. Fischer, Prod. Mgr. 15,000 tons. Hopper system; conveyors; tractor shovels.

MASSACHUSETTS

ADAMS

E—Shea Chemical Corp.
P. O. Box 208; tel: 1292. (Main ofc.) Harold H. Fletcher, Jr., Supt. Phosphoric acid plant.

ATTLEBORO

CD—N. Roy & Son
Rear 618 Newport Ave. Joshua Lecht, Owner.

BOSTON

Consolidated Rendering Co.
General offices: 178 Atlantic Ave. (10); tel: Capitol 7-2520. Leon E. Smith, Pres.; Walter E. Meeken, V.P. & Mgr. Fert. Dept.; John H. Downing, Treas.; V. A. Ericson, Pur. Agt. Plants at: West Haven, Conn.; Portland, Me.; Chicopee & N. Billerica, Mass.; Syracuse, N. Y.; Burlington, Vt.

CAMBRIDGE

Cag—Eastern States Farmers Exchange, Inc.
Rindge Ave. Ext.; P. O. Box 85 (40); tel: TRowbridge 6-2613. (Main ofc: W. Springfield, Mass.) Louis F. Cizek, Plant Mgr. 60,000 t. cap.; 35,000 t. stor. 2 mixing units, 25 t./hr. ea.; 4 shipping units; 30 t./hr. ea.; hopper systems; granulating unit; conveyors for bulk and bagged goods; electric & gas powered trucks & tractors; power shovels.

O—John Reardon & Sons
51 Waverly St. (39). Animal by-products plant.

CHICOPEE

CL—Springfield Rendering Co.
2 Plainfield St.; P. O. Box 379 (Springfield 1); tel: REpublic 4-1174. (Main ofc: Consolidated Rendering Co., Boston, Mass.) W. M. French, Mgr. 6,000 t. cap.; 3,000 t. stor.

NORTH BILLERICA

BaL—Lowell Rendering Co.
Billerica Ave.; P. O. Box 149 (Lowell); tel: GLenview 9-9305. (Main ofc: Consolidated Rendering Co., Boston, Mass.) Henry K. Norwood, Plant Mgr. Superphosphate; 30,000 t. cap.; 17,000 t. stor.; mixed goods: 20,000 t. cap.; 16,000 t. stor. 1 mfg. mill & 4 shipping mills, 125-140 t./day; 8 Payloaders; 4 Truck tractors; 1 conveyor; 1 crane.

NORTH WEYMOUTH

A—The American Agricultural Chemical Co.
285 River St.; tel: (Weymouth) 9-2640. (Main ofc: New York, N. Y.) Robert Mossman, Mgr.; F. C. Manuel, Supt.

SOUTH DEERFIELD

C—Old Deerfield Fertilizer Co., Inc.
20 Sugar Loaf St.; tel: NORmandy 5-2115. Clarence F. Clark, Pres.; Ernest S. Russell, Treas. & Gen. Mgr.; William H. Callahan, Supt. 15,000 t. cap.; 20,000 t. stor. 2 mills, 1 1/4 tons; Hough Payloaders; Clark Truck-tractor.

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
s—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

WEST SPRINGFIELD

Eastern States Farmers' Exchange, Inc.
General offices. 26 Central St.; tel: RRepublic 3-3131. W. D. Milsop, Gen. Mgr.; W. H. Prigmore, Dir. Purch. & Prod.; J. R. Myers (York, Pa.) Fert. Prod. Mgr. Plants located at: Wilmington, Del.; Cambridge, Mass.; Kittanning & York, Pa.

WOBBURN

Ba—International Minerals & Chemical Corp.
316 New Boston St.; P. O. Box 230; tel: 2-1036, 2-1037. (Main ofc: Chicago, Ill.) F. R. Witham, Actg. Area Mgr.; E. J. Comer, Jr., Supt.

MICHIGAN

DEARBORN

E—Ford Motor Co.
3000 Schaefer Rd.; tel: LUzon 1-4600, Ext. 4157. Ammonium sulfate: 14,000 t. cap.; 3,000 t. stor.

DETROIT

A—The American Agricultural Chemical Co.
204 S. Forman Ave.; P. O. Drawer 2458 (31); tel: Vinewood 2-0146. (Main ofc: New York, N. Y.) L. P. Downham, Gen. Mgr.; E. W. Sale, Supt.

SCL—Helfco Laboratories, Inc.
20120 Sherwood Ave. (34); tel: TW 2-9266. J. A. Hannum, Pres. & Mgr.; C. M. Hannum, Sec.-Treas. 500 t. cap.; 200 t. stor.

FOWLERVILLE

CFH—Klein Soil Service
401 S. Free St.; tel: CAsle 3-8732. Clayton Klein, Owner; Robert W. Parsons, Plant Mgr. 6,000 t. cap.; 1,000 t. stor. 1 mill, 6 t./hr.; hopper system; 4 conveyors; 2 elevators; tractor shovel. Plant also at St. Johns, Mich.

HAMILTON

CF—Hamilton Farm Bureau Cooperative, Inc.
Joseph G. Schipper, Pres.; James Koopman, V.P.; Andrew G. Lohman, Sec.-Treas. & Mgr. 2,500 t. cap.; 1,000 t. stor. 1 mill, ½ ton mixer; belt conveyor to truck for bulk fertilizer delivery. Planning liquid mix plant also.

HOLLAND

C—Smith Agricultural Chemical Co.
Tel: 4222. (Main ofc: Columbus, Ohio.) Harry R. Smith, Div. Mgr.; Ernest H. Post, Asst. Mgr.; Vernon Van Oort, Supt. 25,000 tons. 1 mill, 25 tons per hr. (combination mixing & bagging); Jeffrey feeders & Columbus conveyors.

SL—Stanton Co.

149 E. 26th St.; P. O. Box 116; tel: 2578, 8212. F. W. Stanton, Pres. & Treas.; A. G. Stanton, Sec. Liq. fert. for house plants only. 1 mill, 2,500 bottles daily; mixing, filling, labeling machines.

KALAMAZOO

CagP—Farm Bureau Service, Inc.—Plant Food Div.
2040 Olmstead Rd.; P. O. Box 148; tel: 2-9841. (Main ofc: Lansing, Mich.) Richard Cocks, Plant Mgr. 40,000 t. cap.; 10,000 t. stor. 3 mills, 20 t./hr.; 3 Rapid Island conveyors; 9 Stevens-Adamson conveyors; 9 Stevens-Adamson hoppers; 3 large tractors; 2 small tractors.

LANSING

Bag—Davison Chemical Co.—Div. W. R. Grace & Co.
N. High St.; P. O. Box 1348; tel: 2-0826. (Main ofc: Baltimore, Md.) B. C. Manker, Dist. Mgr.; V. G. Vabinder, Plant Mgr.

Farm Bureau Service, Inc.

4000 N. Grand River; tel: IVanhoe 7-5911. General offices. Martin Garn (Charlotte, Mich.), Pres.; Keith Tanner, Mgr. of Oper.; John C. Sexson, Actg. Mgr. Plant Food Div.; M. J. Buschlen, Mgr. Pest. Div. Plants at Kalamazoo & Saginaw, Mich.

SAGINAW

B—The American Agricultural Chemical Co.
P. O. Box 1228; tel: 2-2139. (Main ofc: New York, N. Y.) W. L. Beales, Mgr.; Herbert MacKinnon, Supt.

BagP—Farm Bureau Service, Inc.
800 S. Outer Dr.; P. O. Box 867; tel: 3-5496. (Main ofc: Lansing, Mich.) Russell Vincent, Actg. Plant Mgr. 45,000 t. cap.; 12,000 t. stor. 4 mills, 20 t./hr.; hoppers; stationary & shuttle conveyors; 4 large tractors; 3 small tractors.

BF—The Smith Agricultural Chemical Co.

3010 Holland Ave.; P. O. Box 766; tel: 2-5136. (Main ofc: Columbus, Ohio.) C. B. Stevens, Div. Mgr.; Virgil L. Sanford, Supt. 60,000 t. cap.; 15,000 t. stor. 1 mill, 50 t./hr.; tractor shovels; conveyor system; automatic batching equipment.

ST. JOHNS

CF—Klein Soil Service
(Affiliate of Klein Soil Service, Fowlerville, Mich.) Clayton Klein, Norman Irrer & Donald Irrer, Ptnrs. (plan to incorporate); Bertie A. McNeilly, Plant Mgr. 5,000 t. cap.; 800 t. stor.

MINNESOTA

ALBERT LEA

C—Smith-Douglass Co., Inc.
P. O. Box 850. (Main ofc: Norfolk, Va.) M. W. Mawhinney, Branch Mgr.

DULUTH

O—Duluth Sewage Disposal Dept.
Ofc: 414 W. 1st St.; plant 25th Ave. W. & Courtland (6). M. D. Lubratovich, Mgr.; Carl A. Lund, Supt. 60 t. cap.; 60 t. stor. Sewage sludge.

HATFIELD

CagFH—Bob Fruen Fertilizer Co.
Tel: Pipestone 3134. Bob Fruen & Paul Fruen, Active Ptnrs.; Jack

Schroeder, Plant Mgr. 5,000 t. cap.; 3,500 t. stor. 1 mill; 2 belt conveyors; 7 Fargo Landers hopper bins; 2 Stedman legs; 1 tooth conveyor; 1 Stedman mixer; 1 Stedman clog buster; 3 Stedman screens.

MINNEAPOLIS

CaFPm—Howe, Inc.

4821 Xerxes Ave., N. (12); tel: JUniper 2747. Roy M. Howe, Pres.; Bill Howe, V.P. & Treas.; Carol Comstock, Sec.; Warren W. Gray, Gen. Mgr. 30,000 tons. 1 hopper system; conveyor belts length of bldg. and between buildings.

CagFP—Land O'Lakes Creameries, Inc.

2215 Kennedy St., N. E.; tel: STerling 1-4811. Chester A. Johnson, Gen. Mgr. — Feed, Seed & Plant Food Div.; Philip F. Stocker, Mgr. Plant Food Dept.; Alex Klopka, Supt. 40,000 t. cap.; 15,000 t. stor. Hopper systems; conveyors; tractor shovels.

SAINT PAUL

CagPf—Minnesota Farm Bureau Service Co.

101 E. Fairfield Ave. (1); tel: CApi-tal 2-2571. D. A. Williams, Gen. Mgr.; Howard Gooler, Prod. Mgr.; A. D. Milburn, Pur. Agt.; Eldon Jacobson, Mgr. Pest. Div. 50,000 t. cap.; 25,000 t. stor. 1 mill; hopper system; conveyors; tractor shovels.

Northwest Cooperative Mills

General office. 635 N. Fairview Ave. (W4); tel: MIdway 6-9664. E. A. Syftstad, Pres.; James Rose, Sec.-Treas.; A. H. Roffers, Gen. Mgr.; G. O. McMillin, Mgr. Fert. Div. Plants at Winona, Minn. & Green Bay, Wisc.

WELCOME

CaF—Welcome Agricultural Chemical Co.

Tel: 200. A. J. Schuler, Pres. & Mgr.; E. W. Eickelberg, V.P.; W. C. Bicknase, Sec.-Treas.; Clifford Nelson, Plant Mgr. 25,000 t. cap.; 6,500 t. stor. 1 mill, 20 t./hr.; hopper systems; conveyors; tractors.

WINONA

C—Armour Fertilizer Works

4th & Adams St.; P. O. Box 87; tel: 2895, 2896. (Main ofc: Atlanta, Ga.) L. O. Peterson, Div. Mgr.

Bag—Northwest Cooperative Mills, Inc.

Tel: 2884. (Main ofc: St. Paul, Minn.) Jack Stolar, Plant Mgr.; James Manthe, Plant Supt. 75,000 tons mixed goods & 50,000 tons normal superphosphate. Broadfield acidulator; TVA modified granulator; 2 shipping mills, 70 t./hr.; air-operated scale hopper system; belt conveyors.

MISSISSIPPI

AMORY

Ca—North East Mississippi Fertilizer Co.

Box 156; tel: 850. W. H. Bryan (Mgr.) & J. L. Bryan, Ptnrs. 3,000 t. cap.; 1,300 t. stor. Davidson-Kennedy hopper system; Hough Pay-loader.

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
a—ammoniate g—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

CANTON

Ba—Mississippi Federated Cooperatives (AAL)
313 Cameron St.; P. O. Box 292; tel: 898. (Main ofc: Jackson, Miss.) J. H. Williamson, Supt. 50,000 t. cap.; 20,000 t. stor. 1 mill, 1 ton; hopper system; conveyors; tractors.

CLARKSDALE

Ba—Southern Agricultural Fertilizer Co.
S. Tallahatchie St.; P. O. Box 728; tel: 4838. Kinchen O'Keefe, Pres. & Pur. Agt.; William H. Gresham, V.P.; W. M. Butler, Sec.-Treas.; Mike O'Keefe, Plant Mgr. 30,000 t. cap.; 8,000 t. stor.

CORINTH

Ca—Mississippi Federated Cooperatives (AAL)
Allen St.; P. O. Box 72; tel: 6876. (Main ofc: Jackson, Miss.) T. B. Mask, Supt. 6,500 t. cap.; 2,500 t. stor. 1 mill, ½ ton; conveyors; tractors.

GREENVILLE

BaP—Kinchen O'Keefe & Co.
1021 S. Broadway St.; P. O. Box 541; tel: 5443. (Main ofc: Southern Agricultural Fertilizer Co., Clarksdale, Miss.) Kinchen O'Keefe, (Clarksdale, Miss.) Ptnr.; C. P. Land, Plant Mgr. 40,000 t. cap.; 25,000 t. stor. 40 t./hr.; 9 Payloaders; 2 Hysters; dragline; Sturtevant equipment.

Ca—Valley Fertilizer Co.
322 Walthal St.; P. O. Box 402; tel: 3304. Robt. M. Harding, Pres.; Edmund Taylor, V.P.; Inez Garrard, Sec.-Treas. 15,000 t. cap.; 7,000 t. stor. 1 mill, 30 t./hr.; continuous ammoniating system incorporating shuttle belt conveyors; numerous weigh hoppers; Hough Payloaders.

GREENWOOD

C—All State Fertilizer Co.
1719 Carrollton Ave.; P. O. Box 732; tel: 73-J & 73-R. Noll P. Davis, Pres.; Noll P. Davis, Jr., Mgr. 1 mill, ¼ ton.

CGPb—Staple Cotton Cooperative Assn.
O. F. Bledsoe, Pres.; A. H. Stone, V.P.; W. M. Garrard, Gen Mgr.; T. R. Wells, C. J. Coleman & J. L. Kethley, Asst. Gen. Mgr.; J. B. Hinton, Sec.-Treas.; E. K. Hyman, Pur. Agt.; Geo. Cooper, Plant Mgr. 7,500 tons.

GULFPORT

A—Gulfport Fertilizer Co.
33rd St. & I.C.R.R.; P. O. Box 986; tel: 460. D. P. Granberry, Pres.; G. E. Covington, V.P.; N. E. Gaston, Sec.-Treas.; D. C. Robinson, Sr., Supt. Sulphuric Acid & Superphosphate Depts.; V. L. Padgett, Supt., Basing & Shipping Depts. 20,000 t. cap.; 10,000 t. stor. 1 mill; hopper system; automatic bagging scales; tractors; conveyors.

CF—Marine Feed & Fertilizer Co.
1618 25th Ave.; P. O. Box 118; tel: 4020 & 4021. R. L. Colson, Owner and Mgr. Plans to cease operation of fertilizer mixing business in winter of '55-'56 season.

HATTIESBURG

BFPm—Meridan Fertilizer Factory
P. O. Box 991; tel: L.D. 130. E. A. Geoghegan, Pres.; M. G. Field, V.P.

& Pur. Agt.; W. F. Hoerner, Sec.-Treas.; W. H. Field, Supt. 50,000 t. cap.; 12,000 t. stor. 3 mills, 40 t./hr.; hopper system; overhead belts; conveyors; Hough Payloaders.

HAZLEHURST

CPb—Hazlehurst Oil Mill & Fertilizer Co.
(Owned and operated by Mississippi Cottonseed Products Co.) W. D. Lowe, Chmn. of Board; H. E. Covington, Pres.; J. R. Mason, Treas.; Frank M. Smith, Local Mgr.; J. L. Book, Supt. 10,000 tons.

JACKSON

CG—Delta Cotton Oil & Fertilizer Co.
P. O. Box 899; tel: 2-3624. L.D. 67. Alfred Jenkins, Pres.; W. R. Barrow, James C. Bolton, V.P.'s; Lowell D. Hamilton, Sec.; R. F. Anderson, Plant Mgr. 25,000 tons. Belt conveyors; hoppers; Payloaders.

Ba—Jackson Fertilizer Co.
2105 N. Mill St.; P. O. Box 118; tel: 6-3441. A. A. Green, Pres.; H. Baird Green, V.P.; Cecil B. Morton, V.P.; Garner W. Green, V.P.; Geo. D. Purvis, Sales Mgr.; J. E. Rednour, Plant Supt. 30,000 tons. 3 mills, 90 tons per hr.; Atlanta Utility hopper system; Payloaders.

BEJ—Mississippi Federated Cooperatives (AAL)
General offices. 414 North St.; P. O. Box 449; tel: 5-4701. H. C. Carter, (Louisville, Miss.) Pres.; F. D. Barlow, (Crystal Springs, Miss.) V.P.; Charlie McNeil, Treas. & Gen. Mgr.; Miss Ruth Cooper, Sec.; E. G. Spivey, Asst. Gen. Mgr.; J. K. Morgan, Jr., Pest. Div. Mgr. Plants at Canton, Corinth, Laurel and Meridian, Miss.

B—F. S. Royster Guano Co.
Livingston Rd.; P. O. Box 876. (Main ofc: Norfolk, Va.) H. R. Turner, Supt.

B—Virginia-Carolina Chemical Corp.
Tel: 6-4401 — 6-4402; Factory tel: 6-3226. (Main ofc: Richmond, Va.)

LAUREL

CaPb—Laurel Oil & Fertilizer Co.
12th Ave & 6th St.; P. O. Drawer 748; tel: 3269, 4242. H. E. Covington, Pres.; J. B. Perry, Jr. & W. S. Welch, V.P.'s; D. P. Granberry, Sec.-Treas.; J. A. Dodd, Supt. 12,000 t. cap.; 4,000 t. stor. Payloader; Atlanta Utility screens.

C—Mississippi Federated Cooperatives (AAL)
(Main ofc: Jackson, Miss.) G. L. Jackson, Supt. 2,500 t. cap.; 1,000 t. stor. 1 mill, ½ ton; tractors.

MACON

CaPb—Imperial Cotton Oil Co.
1st & Pearl; P. O. Drawer 228; tel: 13 & 375. E. T. George, Mgr.; E. T. George, Jr., Asst. Mgr.; Fred Gentry, Plant Mgr. 7,000 t. cap.; 3,500 t. stor. 1 mill; hopper system; conveyors; tractor shovel.

MAGEE

BaP—Magee Cooperative (AAL)
Tel: 3381. E. T. Layton, Pres.; B. T. Flynt, V.P.; Barron A. Smith, Sec.-Treas. & Gen. Mgr.; M. R. Calder, Mgr. Pest. Div.; O. M. Ainsworth, Supt. 30,000 t. cap.; 14,000 t. stor. 1 mill, 1 ton; 6-compartment hopper with scale & hopper; 3 Payloaders; 2 bagging units; 2 cross

conveyors; 2 shuttle conveyors; bulk loading conveyor; bag loading conveyor.

MARKS

BaP—Riverside Fertilizer Factory
Tel: 2221. Wm. King Self, Pres.; M. S. Brown, Supt. 15,000 tons storage capacity. Hopper system; conveyors; tractor shovels.

MERIDIAN

Ca—Eagle Cotton Oil Co.
1600 Eagle St.; P. O. Box 608; tel: 4561. E. A. Morrison, Pres.; Webb Brunson, V.P.; E. E. Morrison, Sec.-Treas. & Pur. Agt.; B. W. Pippin, Supt. 15,000 t. cap.; 12,000 t. stor. 1 mill, 1 ton (25 t./hr.); hopper system; tractors.

Ba—Mississippi Federated Cooperatives (AAL)
Box 1350 (Main ofc: Jackson, Miss.) W. S. Nash, Supt. 30,000 t. cap.; 15,000 t. stor. 1 mill, 1 ton; hopper system; conveyors; tractors.

NEWTON

C—Newton Oil Mill
Tel: 157. (Owned and operated by Mississippi Cottonseed Products Co.) H. E. Covington, Pres.; J. B. Perry, Jr. & G. E. Covington, V.P.'s; G. C. Perry, Sec.-Treas.; W. R. Jones, Plant Mgr. 8,000 tons. 1 mill; Continental belt conveyors.

PHILADELPHIA

CaFP—Supreme Feed & Fertilizer Co.
P. O. Box 356; tel: 563. Bruce Latimer, Pres.; Hugh Latimer, V.P. & Mgr. Pest. Div.; John Latimer, Sec.-Treas.; Lewis Cox, Supt. 15,000 t. cap.; 8,000 t. stor.

TUPELO

Aa—International Minerals & Chemical Corp.
P. O. Box 403; tel: 480, 481. (Main ofc: Chicago, Ill.) J. E. Young, Dist. Sales Mgr.; T. L. Holland, Supt.

VICKSBURG

CPb—Magnolia Fertilizer Co.
P. O. Box 18. C. H. Russell, (Jackson, Miss.), Pres.; B. L. Davis, V.P.; H. T. Bankston, Mgr. & Pur. Agt.; Tom Byrd, Prod. Mgr.

E—Spencer Chemical Co.
(Main ofc: Kansas City, Mo.) W. A. Johnston, Wks. Mgr. Ammonia; ammonium nitrate liquor; ammonium nitrate ammoniating solutions.

WEST POINT

CaP—Crown Chemical & Mfg. Co.
N. Division St.; tel: 501. E. F. Cater, Pres.; Mary Ellen Cater, Sec.-Treas.; R. M. Gentry, Supt. 6,000 t. cap.; 4,000 t. stor. 1 mill; tractor shovel. (Mfg. of insecticides at same plant site under name of Crown Insecticide Co.)

YAZOO CITY

Eg—Mississippi Chemical Corp.
Tel: 1200. C. S. Whittington, (Greenwood, Miss.), Pres.; Owen Cooper, Exec. V.P.; Exec. Comm.: C. L. McNeil, Leroy P. Percy, Mrs. Esma A. Hawks, Sec.-Treas.; Jno. C. Satterfield (Jackson, Miss.), Gen. Counsel; W. B. Dunwoody, Gen. Operations Mgr. Anhydrous ammonia production rate of 90,000 annual tons, portion of which is converted to 140,000 annual tons ammonium nitrate.

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
s—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

MISSOURI

ALBANY

CgFPm—Missouri Farmers Assn., Inc.—Plant Food Div.
P. O. Box 92; tel: 388 (Main ofc: Columbia, Mo.) Curtis E. Grace, Plant Mgr. 3,000 t. cap.; 1,000 t. stor.

BOONVILLE

CF*—R. L. Aggeler Coal & Fertilizer Co.
Tel: 895. R. L. Aggeler, Owner & Mgr. 10,000 tons.

CF—Boonville Mill & Grain Co.
Tel: TU 2-6502. R. E. Casanova, V.P.; L. Thoma, Supt. 1,000 t. stor. 1 mill, 100 t.; mixer; conveyors; tractor shovels.

BRAYMER

CFPbm—Consumers Oil & Supply Co.
Tel: 107. Bennett Long, Pres.; Orville Cramer, V.P.; Clifford Sparks, Sec.-Treas.; Odus Clevenger, Gen. Mgr. 10,000 t. cap.; 400 t. stor. Tractor shovel; mixing hopper; scales; loading auger; rock phosphate hopper & auger.

BUTLER

CgFPm—Missouri Farmers Assn., Inc.—Plant Food Div.
P. O. Box 210; tel: 85. (Main ofc: Columbia, Mo.) Vern Y. Merritt, Plant Mgr. 3,000 t. cap.; 1,000 t. stor.

CALIFORNIA

CgFPm—Missouri Farmers Assn., Inc.—Plant Food Div.
Rte. 2; tel: 580. (Main ofc: Columbia, Mo.) Earl Barry, Plant Mgr. 3,000 t. cap.; 1,000 t. stor.

CANTON

CFHPm—Tri-State Fertilizer Co.
Front St.; tel: 18. Richard Pulse, Pres. & Mgr.; W. H. Ayers, V.P.; Clara B. Pulse, Sec. 3,000 t. cap.; 650 t. stor. 1 LA40 Trojan Loader; bucket elevator; 6 screw conveyors; belt conveyor; 3 blending hoppers; portable bagging hopper with Exact Weight unit; Union sewing machine.

CENTRALIA

CgFPm—Missouri Farmers Assn., Inc.—Plant Food Div.
(Main ofc: Columbia, Mo.) Edgar Bailey, Plant Mgr. 3,000 t. cap.; 1,000 t. stor.

COLUMBIA

Missouri Farmers Assn., Inc.
General offices. 201 S. 7th St.; tel: 9741. Fred V. Heinkel, Pres.; L. O. Wallace, V.P.; R. J. Rosier, Sec.-Treas.; Loryn E. McQuenter, Mgr. Plant Food Div.; William L. Ballew, Mgr. Bulk Plant Oper. Plants at Albany, Butler, California, Centralia, E. Dorado Springs, Gallatin, Joplin, Lockwood, Maryland Heights, Rolla, Slater, Springfield & Union, Mo.

EL DORADO SPRINGS

CgFPm—Missouri Farmers Assn., Inc.—Plant Food Div.
Tel: 707. (Main ofc: Columbia, Mo.) Orville J. Carr, Plant Mgr. 3,000 t. cap.; 1,000 t. stor.

GALLATIN

CgFPm—Missouri Farmers Assn., Inc.—Plant Food Div.
(Main ofc: Columbia, Mo.) K. C. Froman, Plant Mgr. 3,000 t. cap.; 1,000 t. stor. (Plant under construction at time of publication.)

JEFFERSON CITY

Farm Bureau Service Co. of Missouri, Inc.
General offices only. 223 E. Capital Ave.; P. O. Box 658; tel: 6-4171. H. E. Slusher, Pres.; Frank D. Johnson, Sec.-Treas.; Earl F. Downen, Gen. Mgr.; Bill B. Mainord, Plant Mgr. & Pur. Agt.; Delbert Garnett, Mgr. Pesticide Div. Plant at New Florence, Mo.

JOPLIN

Aag—Davison Chemical Co.—Div. W. R. Grace & Co.
Ofc: 102 Wall St.; plant: Atlas Village; tel: MAYfair 4-6900. (Main ofc: Baltimore, Md.) John W. Ground, III, Dist. Mgr.; A. C. McCall, Mgr.

Aag—Missouri Farmers Assn., Inc.—Plant Food Div.
State Line & Bell Center Rds.; P. O. Box N, Sta. A; tel: MAIN 4-5225. (Main ofc: Columbia, Mo.) Walter R. Horn, Plant Mgr. 70,000 t. cap.; 15,000 t. stor. 2 rock mills; numerous hoppers; conveyors; elevators.

KANSAS CITY

Consumers Cooperative Assn.
General offices. 318 E. 10th St.; P. O. Box 2359; tel: GRrand 6050. Howard A. Cowden, Pres. & Gen. Mgr.; Bruce McCully, 1st Asst. Gen. Mgr.; Merle A. Blue, Dir. Fert. Mfg.; W. L. Barrett, Mgr. Pesticide Div. Plants at: Eagle Grove, Iowa; S. St. Joseph, Mo., & Muskogee, Okla.

Spencer Chemical Co.

General offices. Dwight Bldg.; tel: BALtimore 6600. Kenneth A. Spencer, Pres.; C. Y. Thomas, V.P.; (Operations); J. E. Culpepper, V.P.; (Sales); John P. Miller, V.P. (Finance); Harold R. Dinges, Gen. Sales Mgr.; Claude L. Byrd, Dir. Ag. Chem. Sales. Plants at: Pittsburg, Kans.; Henderson, Ky.; Vicksburg, Miss.

LA PLATA

CagF—LaPlata Chemical Co.
Tel: 400. M. E. Belt, Pres.; H. L. Beckman, V.P. & Gen. Mgr.; Scott Gault, Treas.; Lester E. Dent, Sec. 15,000 t. cap.; 3,000 t. stor. 2 mills; all types mechanized equipment.

LOCKWOOD

CagFPm—Missouri Farmers Assn., Inc.—Plant Food Div.
Tel: 30. (Main ofc: Columbia, Mo.) Victor E. Wardlow, Plant Mgr. 3,000 t. cap.; 1,000 t. stor.

MARYLAND HEIGHTS

BagPm—Missouri Farmers Assn., Inc.—Plant Food Div.
Adie & Dorsett Rd.; P. O. Box 170; tel: PErshing 1-0940. (Main ofc: Columbia, Mo.) J. Howard McNeill, Plant Mgr.; A. E. Gibson, Supt. 50,000 tons.

NEW FLORENCE

CagFPbm—Farm Bureau Service Co. of Missouri, Inc.
U. S. Hwy. 40 at State Rd. 19; P. O.

Drawer C; tel: 67, 72. (Main ofc: Jefferson City, Mo.) E. F. Downen, Gen. Mgr.; Bill B. Mainord, Prod. Mgr.; Milford Miller, Supt.; Delbert Garnett, Mgr. Pest. Div. 20,000 t. cap.; 8,000 t. stor. 2 mills, 25 t./hr.; hoppers; belt conveyors; screen mixers; bagging equipment; tractor shovels.

NORTH KANSAS CITY, MO.

C—Armour Fertilizer Works.
110 W. 19th St.; P. O. Box 7431 (16); tel: VICTor 0389 & 0390. (Main ofc: Atlanta, Ga.) J. W. Eagleburger, Div. Mgr.

PLATTSBURG

LHPm—Sur-Gro Plant Food Co.
P. O. Box 353; tel: 18. Eldon Freeman, Pres. & Mgr.; Howard Freeman, V.P. 4,000 t. cap.; 100 t. stor.

ROLLA

CgFPm—Missouri Farmers Assn., Inc.—Plant Food Div.
P. O. Box 542; tel: 1710. (Main ofc: Columbia, Mo.) Donald J. Fitzgerald, Plant Mgr. 3,000 t. cap.; 1,000 t. stor.

ST. LOUIS

BgL—American Phosphate Co.
101 S. Mermac Ave. (5); tel: VO 3-3922. Earl A. Fallin, Pres.; V. P. Fallin, V.P.; Joseph Long, Sec.

BaPm—Lange Brothers

1 Angelica St. (7); tel: CHEstnut 1-9531. Henry K. Lange, Pres.; Dewey K. Lange, Sec.-Treas.; Nelson Hartman, V.P.; Walter Fittge, Supt. 30,000 t. cap.; 15,000 t. stor. 2 mills, 20 t./hr.; Stedman acidulator; Stedman mixer; Stedman bagger, 30 tons; hopper system; conveyors & shuttle conveyors.

Mississippi River Chemical Co.—

Div. Mississippi River Fuel Corp.
407 N. 8th St.; tel: GARfield 1-2030. W. G. Marbury, Pres.; E. P. Kramer, V.P.; John L. Sanders, Sales Mgr. Plant at Selma, Mo.

SELMA

E—Mississippi River Chemical Co.—Div. Mississippi River Fuel Corp.
(Ofc: St. Louis, Mo.) C. L. Lashlee, Plant Mgr. Capacity 140,000 annual tons (20,000 t. anhydrous ammonia, 60,000 t. prilled ammonium nitrate, 60,000 t. ammonium nitrate solutions); storage: 40,000 t.

SIKESTON

CaPm—Missouri Plant Food Co., Inc.
Hwy. 60 W.; P. O. Box 594; tel: 2343. (Main ofc: Ark-Mo Plant Food Co., Inc., Corning, Ark.) L. G. Black, Pres.; W. J. Jacob, V.P.; Rex Morgan, V.P.; Earl Day, Sec.-Treas.; Percy McCall, Plant Mgr. & Pur. Agt. 25,000 tons. 3 bagging mills; 1 mixing mill; 2 distributor belts; 1 cross belt; 3 loading conveyors; 1 hopper.

SLATER

CgFPm—Missouri Farmers Assn., Inc.—Plant Food Div.
P. O. Box 186; tel: 19. (Main ofc: Columbia, Mo.) David Farley, Mgr. 3,000 t. cap.; 1,000 t. stor.

SOUTH ST. JOSEPH

BagFPbm—Consumers Cooperative Assn.
Lower Lake Rd.; P. O. Box 596; tel: 8-0720. (Main ofc: Kansas City, Mo.)

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
 a—ammoniate g—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

Carl A. Greenberg, Plant Mgr. 40,000 t. cap.; 5,000 t. stor. 1 mill, 10-15 t./hr.; hopper systems; granulation equipment; belt conveyors; tractor shovels; batch mixer; dryer drums; St. Regis bagger; 2 Dies-ter screens.

SPRINGFIELD

BaPm—Missouri Farmers Assn.—Plant Food Div.
 Box 1546, South Side Sta.; tel: 2-7022, H. Leland Holman, Plant Mgr. 50,000 tons.

TRENTON

Cag—Davison Chemical Co.—Div. W. R. Grace & Co.
 P. O. Box 220; tel: 316. (Main ofc: Baltimore, Md.) A. C. McCall (Joplin, Mo.), Mgr.; J. R. Bass, Plant Supt. 25,000 tons.

UNION

CgFPm—Missouri Farmers Assn., Inc.—Plant Food Div.
 Rte. 1; tel: 716 R1. (Main ofc: Columbia, Mo.) Oliver E. Barnard, Plant Mgr. 3,000 t. cap.; 1,000 t. stor.

WEBB CITY

Ba—Tri-State Chemical Co.
 S. of Hall St. Rd.; P. O. Box 591; tel: 1322. L. J. Savanna, Pres. & Gen. Mgr.; Milo Johnson, V.P.; Clifford Casey, Sec.-Treas.; Sterling C. Gant, Jr., Supt. 25,000 t. cap.; 9,000 t. stor. 1 mfg. mill & 2 bagging mills, 25 t./hr.; tractors; complete hopper & conveyor systems. Plant also at Springdale, Ark.

MONTANA

ANACONDA

AE—The Anaconda Co.—Fertilizer Dept.
 Tel: 925. R. A. Jones, Sales Mgr. Fert. Dept. 100,000 tons treble superphosphate, ammoniated phosphate, liquid phosphoric acid & mixed fertilizer.

HARLOWTON

SO—Western Fertilizers
 P. O. Box 1505. C. William Parker, Pres.; C. D. Burrington, V.P. & Mgr.; Mrs. Erleen Burrington, Sec.-Treas. Process & package manures, planting soils, peat moss & vermiculite. 1 mill, 20 tons daily; 1 belt conveyor; 1 hopper & bagger.

NEBRASKA

AUBURN

LHPbm—Auburn Fertilizer Co.
 1802 P St.; P. O. Box 185; tel: 494W. Richard Bennett, Pres.; Bill Asbell, Sec.; John White, Treas. & Mgr. 5,000 t. cap.; 150 t. stor. Pumps; scales; batch tanks; agitators; compressors; conveyors for dry potash & urea.

BAYARD

CDPf—Sure-Crop Chemical Co.
 Tel: 3611. Art Crouch, Owner; Merle Garwood, Mgr. Dry mix fertilizers, formulate insecticides & manufacture dusts.

FAIRBURY

CagPm—National Fertilizer Co.
 800 Bloch Arcade St.; P. O. Box 51; tel: 1695. (Main ofc: Des Moines, Iowa) Theodore D. Doyle, Plant Mgr. & Pur. Agt.; Harold Tabor, Supt. 20,000 t. cap.; 3,000 t. stor. 1 mill. 6-10 t./hr.; 3 Payloaders; sling-er.

FALLS CITY

Cag—Falls City Fertilizer, Inc.
 Tel: 1077. (Main ofc: Grand Island, Nebr.) G. L. Downey, Sec.-Treas. & Plant Mgr.; Louis Willits, Prod. Mgr. 10,000 t. cap.; 5,000 t. stor. Ammoniator; ½ ton Atlanta Utility unit; 2 tractor shovels; overhead belt system; piling conveyors.

FREMONT

CagFPm—General Fertilizer Co.
 301 E. Washington; P. O. Box 548; tel: 84. W. A. Koepplin, Pres.; Stewart Daniels, V.P. & Mgr.; J. M. Rice, Treas. 15,000 t. cap.; 4,000 t. stor. 1 mill, 12-15 t./hr.; hopper systems; conveyors; tractor shovels; complete mechanization.

GENEVA

LHPbm—Agricultural Chemical & Supply Co.
 P. O. Box 27; tel: 46. John L. Sloane, Pres. & Mgr.; Clement B. Pederson, Sec.-Treas.; Richard T. Carey, & P. H. Hornburg, V.P.'s. 16,000 gal/day cap.; 131,000 gal. stor. Re-actor tank; Payloader; etc.

GRAND ISLAND

Falls City Fertilizer, Inc.
 Office: E. Lincoln Hwy.; P. O. Box 922; tel: 3237. Howard L. Peterson, Pres.; B. F. Backlund, V.P.; G. L. Downey, Sec.-Treas. Plant at Falls City, Nebr.

Cag—Lincoln Service & Supply, Inc.
 E. Lincoln Highway; P. O. Box 1206; tel: 3237. Howard L. Peterson, Pres.; B. F. Backlund, V.P., G. L. Downey, Sec.-Treas. & Prod. Mgr. 20,000 t. cap.; 6,000 t. stor. 2 mills; hopper weighing system; Weather-ly granulation system; valve pack-er; overhead conveyor; 4 Hough tractor shovels.

McCook Fertilizer, Inc.

Office: E. Lincoln Highway; P. O. Box 33; tel: 3237. Howard L. Peterson, Pres.; B. F. Backlund, V.P.; G. L. Downey, Sec.-Treas. Plant at McCook, Nebr.

LINCOLN

SC—Roigina Products
 4811 Holdrege St.; P. O. Box 345; tel: 6-2725. R. W. Amos (Plant Mgr.) & F. C. Amos, Ptnrs. House plant fertilizers.

CO—Soiltone Fertilizer Co.

22nd & Theresa; P. O. Box 1708; tel: 2-6205. John P. McFarland, Pres.; H. J. Rosser, V.P.; R. H. Schum, Treas.; J. W. Schum, Sec. & Plant Mgr. 3-5,000 t. cap.; 1,000 t. stor. 1 mill, 4 t./hr.; 2 hoppers, 3 & 12 tons; ½ ton mixer; 50 ft. rotary dryer; 5 conveyors, 2 20 ft., 3 30 ft.; sack & sewing machine; 2 trac-tors; 5 ton truck.

McCOOK

C—McCook Fertilizer, Inc.
 C. B. & Q. Roundhouse. (Main ofc: Grand Island, Nebr.) G. L. Downey,

Sec.-Treas. & Plant Mgr.; Stan Slay, Prod. Mgr. 10,000 tons.

MAGNET

LHPbm—J. D. & L. Fertilizer, Inc.
 Tel: 67. Floyd Dawson, Pres. & Mgr.; Melvin Lindahl, Sec. 30,000 gal. stor.

OGALLALA

S—Chemical Specialties, Inc.
 216 N. Spruce St. Dale Miller, Mgr.

OMAHA

BagLPbm—Farm Fertilizers, Inc.
 7500 S. 13th St.; P. O. Box 351 (S. Omaha); tel: MARKET 9181. R. E. Bennett, Pres.; L. M. Brannan, V.P.; T. J. Hoshall, V.P.; Arthur C. Jetter, Sec. & Pur. Agt.; W. H. Woodard, Plant Mgr.; Phillip C. Shugart, Prod. Mgr. 50,000 tons superphosphate & mixed fertilizer; 11,000 tons storage. 2 St. Regis ship-ping mills, 25 t./hr. each; complete hopper system; continuous ammon-iation system; belt conveyors throughout.

BLE—Jespersion, Inc.

2111 Nicholas St. (2); tel: ATLantic 1979. H. P. Jespersen, Pres.; Thom-as R. Finn, 1st V.P.; George Talo-vich, Plant Mgr. 25,000 t. cap.; 500 t. stor. 2 mills, 40 t./hr.; crusher; grinders; dryers; conveyors; screens; bagger. Also operate: Wy-oming Minerals, Inc., Thermopolis, Wyo.

*Nebraska Fertilizer Co.

C. H. Smith, Supt.; Lenn Snow-den, Prod. Mgr. 4,000 tons.

SCHUYLER

LHPbm—Wagner Farm Products Co., Inc.
 1233 Colfax St.; tel: 224. A. F. Svoboda, Pres.; Herman J. Wragge, V.P.; H. B. Chronister, Jr., Sec.-Treas. (Plant under construction at time of publication.)

SCOTTSBLUFF

CagFLHPm—Curry Chemical Div.—Phillips Petroleum Co.
 1018 W. 26th St.; P. O. Box 397; tel: 1755. (Main ofc: Bartlesville, Okla.) R. A. Kurland, Gen. Mgr.; Warren Johnston, Plant Mgr. Hoppers; con-veyors; Payloaders; bagging equip-ment. Liquid mix plant capacity 40 t./day.

SOUTH OMAHA

E—Nitrogen Div.—Allied Chemical & Dye Corp.
 P. O. Box 354 (7); tel: Bellevue 0090. (Main ofc: New York, N. Y.) R. L. Riggs, Mgr. Ammonia, Urea, Urea-Ammonia solution.

SOUTH SIOUX CITY

CPfm—Crystal Chemical Co., Inc.
 Box 116; tel: 4261. Fay P. Stewart, Pres.; Louis McLaughlin, V.P.; Wil-liam S. Brown, Sec.; Thomas E. Meylor, Plant Mgr.; G. M. Det-weiler, Mgr. Pest. Div. 20,000 t. cap.; 5,000 t. stor. 3 mills, 25 tons per hr.; York Foundry elevators & belt conveyors; Blue Valley granu-lation unit; 3 HA Hough Payload-ers.

C—National Fertilizer Co.—Div. National By-Products, Inc.
 (Main ofc: Des Moines, Iowa) George Mitchell, Mgr. 1 mill, 25 t./hr.

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
S—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

NEVADA

LOVELOCK

O—Growers Fertilizer Co.
(Main ofc: Stockton, Calif.) 5,000 tons pulverized sheep manure.

NEW JERSEY

BAYONNE

E—The Baker Castor Oil Co.
(Main ofc: New York, N. Y.) Castor meal & pomace plant.

BRIDGETON

CaFP—Coop. G.L.F. Soil Building Service
Manheim Ave.; tel: 9-1611. (Main ofc: Ithaca, N. Y.) John Stark, Supt. 22,000 t. cap.; 9,000 t. stor. 2 mills, 35 t./hr.; conveyors; 5 tractor shovels.

CFP—Miller Chemical Co. of N. J.
P. O. Box 96; tel: 9-7545. L. W. Cameron, Pres.; Howard F. Long, V.P.; W. D. Ashmore, Treas.; C. E. Carr, Sec.; Walter Malyk, Local Mgr.; A. G. Fischer, Supt.

CaFP—Star Fish & Bone Fertilizer Co.
Ofc: Bank & Penn Sts.; Plant: 67 S. Laurel St.; tel: 9-0704, 9-0705. Charles A. Lubow, Pres.; Albert Serata, V.P.; Jack G. Kolman, V.P.; Benjamin Serata, Treas.; David M. Lourie, Sec.; Aubrey Bitzer, Supt. & Mgr. Pest. Div.; Gerald G. Goldstein, Plant Mgr. 10,000 t. cap.; 6,000 t. stor. 2 mills, 1½ ton mixer each; ½ yd. shovel; 3 Payloaders; 2 scoopmobiles; 6 conveyors; 1 burlap bagger; 3 paper packers; 3 spreaders.

CARTERET

A—The American Agricultural Chemical Co.
Tel: 1-5171. (Main ofc: New York, N. Y.) J. H. Banning, Mgr.; S. D. Ward, Supt.

A—Armour Fertilizer Works
P. O. Box "J"; tel: 1-4111. (Main ofc: Atlanta, Ga.) S. R. Post, Div. Mgr.

B—Virginia-Carolina Chemical Corp.
Tel: 1-5191; factory tel: 1-5193. (Main ofc: Richmond, Va.)

COLLINSWOOD

CDFPm—Fertilizer Products Corp.
22-32 White Horse Pike; tel: 5-6800. M. E. Fox, Pres.; Rosemary A. Fox, V. P.; Harold Paul Fox, Sec.-Treas. & Plant Mgr. 2,000 tons.

CRANBURY

CaFP—Chamberlin & Barclay, Inc.
Tel: 5-0700. Isaiah D. Barclay, Pres. & Treas.; Albert C. Barclay, V.P.; E. Stanley Barclay, Exec. V.P.; Sec. & Asst. Treas.; L. Graham Campbell, Prod. Mgr. & Mgr. Pest. Div. 25,000 t. cap.; 7,000 t. stor. 3 mills, 35 t./hr.; hopper system; tractor shovels; conveyors; minor elements measuring set-up; Richardson scales & taping equipment.

DAYTON

CaFPm—Dayton Fertilizer Corp.
Georges Road & Penn. R. R.; tel: (Monmouth Jet.) 7-4011. Chester S. Edwards, Pres.; S. Schmidt, Sec.; W. A. Nist, V.P., Pur. Agt. & Mgr. Pest. Div.; L. H. Edwards, Plant

Mgr. 25,000 t. cap.; 7,000 t. stor. 1 mill, 200 t./day; conveyors; Payloaders.

ENGLISHTOWN

CaFP—Coop. G.L.F. Soil Building Service
Tel: 7-3481. (Main ofc: Ithaca, N. Y.) A. D. Hoxie, Supt. 12,000 t. cap.; 6,000 t. stor. 2 mills, 30 t./hr.; conveyor system.

HACKETTSTOWN

O—United By-Products Co.
Samuel Beatty, Pres.; L. P. Wilson, V.P.; Kenneth Beatty, Sec.-Treas. 2,000 tons.

HIGHTSTOWN

C—Bennett-Mount Co.
Wyckoff Ave.; P. O. Box 245; tel: 8-1100, -01, -02, -03. G. A. Bennett, George M. Osgood, John H. Mount, (Prod. Mgr.), Ptnrs. 3,500 t. cap.; 2,100 t. stor.

JERSEY CITY

E—The Baker Castor Oil Co.
(Main ofc: New York, N. Y.) Castor meal & pomace plant.

METUCHEN

CLE—Davis Nitrate Co.
(Main ofc: New York, N. Y.) F. L. Morgan, Plant Mgr. Concentrated water soluble fertilizer & trace element blend.

MILLVILLE

C—The Espoma Co.
P. O. Box 431; tel: Taylor 5-0542. H. G. Sanders, Pres. & Treas.; Dean R. Sanders, V.P.; Pearl O. Sanders, Sec. 5,000 t. cap.; 1,000 t. stor. 1 mill; 2 Chantland conveyors; 2 Handy Handler conveyors.

NEWTON

O—Hyper-Humus Co.
P. O. Box 263; tel: 300. S. P. Wetherill, Pres.; W. P. Troxell, V.P.; L. Wayne Army, Sec.; L. B. Kramer, Treas.; S. M. Davis, Supt. Producers of cultivated reed and sedge peat.

PAULSBORO

AgPf—I. P. Thomas Div.—Pennsylvania Salt Mfg. Co.
(Main ofc: Philadelphia, Pa.) R. R. Hull, Gen. Mgr.; George Brown, Plant Mgr.; F. R. Anspach, Mgr. Pest. Div. 100,000 t. cap.; 20,000 t. stor. 3 mills, 35 t./hr.; hopper system; conveyors; tractors; overhead cranes.

PITTSBURY

OPm—Allen Co.
Tel: Clinton 296-J-3. W. A. Allen Gen. Mgr.; Robert E. Allen, Plant Mgr. Organic plant. 2,000 t. cap.; 300 t. stor.; 5 hammer mills, 8 to 15-in. size; 1 Munson 6 rotary mixer with 6 x 6 charging hopper, elevators, etc.; 1 Ransome 4 mixer with skip loader; 1 Bartlett & Snow 4 x 9 jacket digester, mixer, dryer, etc.; 1 Robinson 1-ton ribbon mixer, elevator, hopper & bagger; 1 Tri-angle packer (1 lb. to 25 lb. bags); 1 Speed-Dee packer (½ oz. to 8 oz.); 3 Baird fertilizer pelleting machines, mixer, dryer & cars for fertilizer pellets; 6 ft. & 8 ft. steel hoppers; belt & chain elevators & conveyors; Farmall M front end shovel.

PROSPECT PLAINS

C—Bennett & Clayton Co., Inc.
Tel: CRanbury 5-0666. Edmund A. Rice, Pres.; Victor J. Rice, V.P.; Bernadette E. Rice, Sec.-Treas.; Wilbur Van Hise, Plant Mgr. 3,500 t. cap. 1 mill; hoppers; conveyors; Payloader; bagger.

ROCHELLE PARK

CPm—The Terre Co.
Tel: Hubbard 7-7090. T. A. Terhune, Pres.; C. L. Terhune, Treas.; O. W. Terhune, Sec. & Pur. Agt.; Geo. Scoskie, Supt.; Roy Bossolt, Mgr. Pest. Div. 5,000 t. cap.; 300 t. stor.; 1 mill, 30 t./hr.; screen; grinder; mixer; elevator; valve packer. Branch plant, Totowa, N. J.

SKILLMAN

CLPfm—Goulard & Olena, Inc.
Tel: 215-194. Alexander Goulard, Pres.; Harold G. Olena, V.P.-Treas.; H. J. Wichmann, Gen. Mgr.; Chris Raba, Plant Mgr.; Geo. Hoffman, Trade Sales Mgr.; E. K. Doris, Mgr. Golf Course Maint.; Carroll Raba, Mgr. Pest. Div. 3,500-5,000 t. cap.; 300 t. stor. 3 mills; hoppers; elevators; packaging equipment; grinders; cutting machines; dryers.

SOUTH KEARNY

CaP—Coop. G.L.F. Soil Building Service
Jacobos Ave; tel: (Newark) Market 3-5118. (Main ofc: Ithaca, N. Y.) D. F. Garrison, Supt. 25,000 t. cap.; 8,000 t. stor. 2 mills, 35 t./hr.; conveyor system; 6 tractor shovels.

SPRINGFIELD

CLPf—Doggett-Pfeil Co.
681 Morris Turnpike; tel: Millburn 6-5900. Alfred S. Pfeil, Pres.; Sidney H. Doggett, V.P.; Albert K. Doggett, Sec.; Alfred S. Pfeil, Jr., Plant Mgr. & Mgr. Pest. Div. 5,000 tons. 1 mill, 1 ton; complete Sturtevant mixing & grinding unit.

CDFG—Andrew Wilson, Inc.
C. H. Morrison, Pres. & Treas.; J. E. Morrison, V.P.; H. C. Heim, Sec. 5,000 tons.

TENNENT

CFP—Reed & Perrine, Inc.
Tel: Freehold 8-0373. Frank Perrine, Pres. & Plant Mgr.; John S. Satterthwaite, V.P.; F. Duncan Perrine, Treas. & Prod. Mgr.; George Chambers, Sec. & Pur. Agt. 7,500 t. cap.; 3,500 t. stor. 1 mill, 1 ton; belt conveyor; 1-ton mixer; elevator.

TOTOWA

CP—The Terre Co.
Union Blvd. & Rte. 46; tel: Little Falls 4-1500. (Main ofc: Rochelle Park, N. J.) O. M. Terhune, Plant Mgr.; Roy C. Bossolt, Mgr. Pest. Div.

TRENTON

C—Trenton Bone Fertilizer Co.
New York Ave.; tel: EXport 6-9553. Walter N. Updyke, V.P.; W. Albert Grove, Sec.-Treas.; Robert Nimmo, Supt. 20,000 t. cap.; 10,000 t. stor.

VINELAND

CaF—Wilde Farm Supply Co., Inc.
1051 Hendee Rd.; P. O. Box 164; tel: VI 7-1067. Fred U. Wagner, Pres. & Mgr. 7,000 t. cap.; 200 t. stor. 2 mills, 10 & 20 tons; 2 scoops.

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
a—ammoniate g—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

WARNERS

E—American Cyanamid Co.—Agricultural Chemicals Div.
(Main ofc: New York, N. Y.)

WOODSTOWN

CaFPb—South Jersey Farmers Exchange
Tel: 62. A. L. Waddington, Pres.; Oscar Ware, Treas.; William C. Ware, Asst. Treas.; Sherwin B. Brown, Gen. Mgr.; Lester Flitcraft, Supt. 10,000 t. cap.; 5,500 t. stor. 4 conveyors; 2 tractor shovels.

YARDVILLE

CaFP—Coop. G.L.F. Soil Building Service
Tel: (Trenton) EXport 6-8221.
(Main ofc: Ithaca, N. Y.) John Litzelman, Supt. 25,000 t. cap.; 11,000 t. stor. 3 mills, 35 t./hr.; conveyors; 5 tractor shovels.

NEW MEXICO

ALBUQUERQUE

CFHPf—Edmunds Chemical Co.
2200 2nd St., S.W.; P. O. Box 1016; tel: 3-3506. Edward Edmunds, Jr., Owner & Mgr.; Morris Alcorn, Ofc. Mgr.; Bob Rupp, Supt. 1,500 t. cap.; 500 t. stor. 1 mill, 1 ton; fork lift trucks.

CPm—New Mexico Fertilizer Co.
P. O. Box 462; tel: 3-5522. Arthur Ravel, Pres.; Ira Gibson, Plant Mgr. 1 mill, 10 t./day.

CPf—Ravel Brothers, Inc.
(Also operating New Mexico Fertilizer Co.) 525 2nd St.; P. O. Box 462; tel: 3-5522. Arthur Ravel, Pres. & Mgr. Pest. Div.; Louis Ravel, V.P. & Treas.; Morris Segal, Sec.; John Thomas, Plant Mgr.; Sidney B. Gasser, Prod. Mgr. 10,000 tons.

ANTHONY

CpFHPf—Agricultural Products Co., Inc.
P. O. Box 203; tel: WAbash 6-2322. P. H. Clute, Pres. & Mgr. Pest. Div.; Nelson Clayshulte, Jr. V.P. & Plant Mgr.; H. T. Sowell, Sec.-Treas. 3,000 t. cap.; 1,500 t. stor. Payloader; Yale fork lift truck.

BFHPf—Southwest Fertilizer & Chemical Co.

P. O. Box 204; tel: WAbash 6-2162. (Main ofc: El Paso, Tex.) Buford Luttrell, Plant Mgr.; Jack Humberston, Mgr. Pest. Div. 40,000 t. cap.; 10,000 t. stor.

CARLSBAD

E—Duval Sulphur & Potash Co.
P. O. Box 510; tel: 5-3175. (Main ofc: Houston, Tex.) George E. Atwood, Resident Mgr. 250,000 to 350,000 tons murite of potash.

E—International Minerals & Chemical Corp.—Potash Div.
(Main ofc: Chicago, Ill.) C. A. Arend, Jr., Plant Mgr.

E—Potash Co. of America

P. O. Box 31; tel: 5-2111. G. F. Coope, Pres.; G. E. Pettitt, V.P.; F. O. Davis, V.P. & Treas.; R. G. Hawthorth, V.P. & Resident Mgr.; A. J. Weinig, Jr., Plant Supt.; R. R. Knill, Mine Supt. 800,000 t. cap.

E—Southwest Potash Corp.
(Main ofc: New York, N. Y.) F. H. Stewart, Plant Mgr.

E—United States Potash Co.
(Main ofc: New York, N. Y.) H. H. Bruhn, Resident Mgr. (Mine & refinery.)

CLOVIS

CF—Sunshine Plant Food Co., Inc.
Stockyards Addition; P. O. Box 885; tel: 3773. Bud Williams, Pres.; Z. A. McCasland, V.P.; L. V. Sparks, Sec.; Clyde Rayl, Treas.; Otto Smith, Atty.; C. K. Caldwell, Plant Foreman. 5,000 t. cap.; 100 t. stor. 1 mill; dry mixing equipment; 6 storage bins; 2 sewing machines; dehydrator for manure; Ford tractor with scoop; Hyster "20" fork lift.

NEW YORK

ALBANY

Ca—Coop. G.L.F. Soil Building Service.
Port of Albany; tel: 5-2392. (Main ofc: Ithaca, N. Y.) L. V. Rowley, Supt. 25,000 t. cap.; 9,000 t. stor. 2 mills, 40 t./hr.; complete hopper & conveyor systems; 5 tractor shovels.

BATAVIA

CaFP—Coop. G.L.F. Soil Building Service
Howard Ave.; tel: 1770. (Main ofc: Ithaca, N. Y.) C. A. Facer, Supt. 40,000 t. cap.; 12,000 t. stor. 3 mills, 40 t./hr.; complete hopper & elevator system; 6 tractor shovels; conveyors.

BEACON

CPf—Rose Manufacturing Co.
156 Main St.; tel: 472, 473. O. James Faloon, Pres., Treas. & Pur. Agt.; Earle H. Cochrane, Plant Mgr.

BIG FLATS

CagP—Coop. G.L.F. Soil Building Service
(Main ofc: Ithaca, N. Y.) O. M. Howard, Supt. 30,000 t. cap.; 12,000 t. stor. 4 mills, 35 t./hr.; hopper system; conveyors; 6 tractor shovels.

BLUE POINT

CPf—Plant Products Corp.
Kennedy Ave.; tel: 4-2950. John Szybillo, Pres.; Joseph Schwartz, V.P.; Albert Kromhout, Treas.; Peter F. Finck, Sec. & Mgr.; Edwin J. Camson, Prod. Mgr. 5,000 tons.

BRIDGEHAMPTON

CaP—Coop. G.L.F. Soil Building Service
Tel: 2-0342. (Main ofc: Ithaca, N. Y.) Fred Markert, Supt. 6,000 t. cap.; 2,500 t. stor. 1 mill, 25 t./hr.; conveyors; 2 tractor shovels.

BUFFALO

A—The American Agricultural Chemical Co.
129 Lewis St. (6); tel: Washington 1723. A. J. Curtis, Pres. Produce feather meal. 1,000 t. cap.; 2,000 t. stor. 1 mill.

OE—Economy Reduction Corp.

550 Babcock St.; tel: Washington 1723. A. J. Curtis, Pres. Produce feather meal. 1,000 t. cap.; 2,000 t. stor. 1 mill.

Ba—International Minerals & Chemical Corp.

P. O. Box 21, Sta. A; tel: Taylor 1888 & 1889. (Main ofc: Chicago,

Ill.) J. K. Hoekstra, Dist. Sales Mgr.; C. P. Allen Supt.

CANASTOTA

CaP—Coop. G.L.F. Soil Building Service
James St.; tel: 2266. (Main ofc: Ithaca, N. Y.) Carl Gillmeister, Supt. 30,000 t. cap.; 12,000 t. stor. 2 mills, 35 t./hr.; conveyor system; 5 tractor shovels.

COXSACKIE

Ca—The Baugh & Sons Co., Inc.
Tel: 6-3131 (Main ofc: Baltimore, Md.) H. J. Rassier, Mgr.

DANVILLE

SC—Ra-Pid-Gro Corp.
88 Ossian St. Thomas P. Reilly, Pres. & Plant Mgr.; Jas. J. Blum, Treas.; Frances C. Reilly, Sec.; Karlton Randall, Prod. Mgr. Several tons daily of dry plant food in soluble form for foliage feeding.

FARMINGDALE

CPfm—Morris Karp & Son
81 Secatogue Ave.; Box 44; tel: 2-0206, 2-0158. Lee O. Karp, Owner, Gen. Mgr. & Pur. Agt.; Ed W. Beckvar, Ofc. Mgr.; Jacob F. May, Prod. Mgr.; Frank Colby Supt.; Frank Hicks, Traffic Mgr.; Walen Simon, Mgr. Pest. Div. 10,000 tons. 2 mills, 15-20 t./hr.; belt & slat conveyors; hopper system; Payloaders.

HICKSVILLE, L. I.

CF—Henry A. Pollak & Co.
Charlotte Ave. Henry A. Pollak, Pres.; Rose Pollak, Treas.; Joseph Benaburger, Plant Mgr. 12,000 tons.

HUNTINGTON STATION

CPbm—Gregory-Doyle, Inc.
11th St. at Railroad; P. O. Box 184; tel: 4-6070. Peter J. Doyle, Pres. & Gen. Mgr.; Charles B. Gregory, Sec.-Treas.; Hugh Maxwell, Sales Mgr. & Mgr. Pest. Div.; Joseph Bergin, Supt. 10,000 t. cap.; 4,000 t. stor. 1 mill, 30 t./hr.; completely mechanized.

ITHACA

Coop. G.L.F. Soil Building Service—Div. Coop. G.L.F. Exchange, Inc.
General offices. Terrace Hill; tel: 4-5411. J. C. Crissey, Div. Mgr.; A. M. Eno, Mgr. Fert. Dept.; P. J. McManus, Mgr. Insecticide Dept.; T. J. Clarke, Controller; E. J. Smith, Prod. Mgr. Purchasing Dept. (21 West St., New York, N. Y.): E. H. Phillips, Dir.; R. B. Lenhart, Asst. Dir. Plants at: Albany, Batavia, Big Flats, Bridgehampton, Canastota, Lyons, Middletown (pesticides only) & North Collins, N. Y.; Bridgeton, Englishtown, South Kearny & Yardville, N. J.; Union City, Pa.

JAMESPORT

C—Atlantic Fertilizer Corp.
(Main ofc: Riverhead, N. Y.) R. C. Tuthill, Plant Mgr. 15,000 t. cap.; 10,000 t. stor. 2 mills; hopper & conveyor systems; Payloaders.

LOCKE

C—The Atwater Co.
J. Dwight Atwater, Ptnr. & Pur. Agt.; Louise A. Chester, Ptnr.; Marian A. Bradley, Ptnr.; Ralph D. Coulson, Ptnr., Plant Mgr. & Pur. Agt. 2,000 t. cap.; 1,500 t. stor. Dry mixer; conveyors; tractor shovels.

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
S—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

LYONS

CaGFP—Coop. G.L.F. Soil Building Service

Tel: 242. (Main ofc: Ithaca, N. Y.)
Hugh Litzelman, Supt. 30,000 t. cap.; 12,000 t. stor. 3 mills, 35 t./hr.; conveyors; 6 tractor shovels.

C—F. S. Royster Guano Co.

Cole Rd.; P. O. Box 311. (Main ofc: Norfolk, Va.) W. H. Bigelow, Supt.

MARION

CaFPM—C. Roy Curtis & Son, Inc.

Tel: 4214. C. Albert Curtis, Pres., Treas. & Pur. Agt.; W. Roy Converse, V.P.; Dorothy D. Curtis, Sec.; Howard Hance, V.P. & Gen. Mgr. 10,000 t. cap.; 4,000 t. stor. 1 mill, 5 t./hr.; 2 conveyors—rubber belts; hopper system.

MATTITUCK

CG—Long Island Produce & Fertilizer Co., Inc.

(Main ofc: Riverhead, N. Y.)

NATURAL BRIDGE

LPf—Carbola Chemical Co., Inc.

Tel: 2901. C. J. Zimmerman, Pres.; H. T. Koenig, Sec.-Treas.; Donald Donaghy, Plant Mgr. 36,000 tons.

NEWARK

Ca—The Baugh & Sons Co., Inc.

Tel: 35. (Main ofc: Baltimore, Md.) A. N. Temple, Mgr.

NEW YORK

The American Agricultural Chemical Co.

Executive offices. 50 Church St. (7); tel: BArlay 7-1400. Charles M. Powell, Pres.; Arnold W. Cramer, Sr., V.P.; Gerard W. Gaffney, V.P., Sales Prom. & Adv.; John R. Scherm, V.P., Fert. Sales; Frederick R. George, V.P., Chem. Sales; B. R. Richey, V.P., Prod.; Wm. H. Hildebrandt, Comp.; Hughes Mayo, Sec.-Treas. Plants at: Montgomery, Ala.; Pensacola & Pierce, Fla.; Savannah, Ga.; Fulton & National Stock Yards, Ill.; Humboldt, Iowa; Searsport, Me.; Baltimore, Md.; N. Weymouth, Mass.; Detroit & Saginaw, Mich.; Carteret, N. J.; Buffalo & Phoenix, N. Y.; Greensboro & Henderson, N. C.; Cairo, Cincinnati, Cleveland & Washington Court House, Ohio; Charleston, Columbia & Spartanburg, S. C.; Alexandria & Norfolk, Va.; Port Hope, Ont. & Fort Chambly, Que., Can.; Havana, Cuba.

American Cyanamid Co.—Agricultural Chemicals Div.

General offices. 30 Rockefeller Plaza (20); tel: CIRCLE 7-0100. T. L. Wilkerson, Gen. Sales Mgr.; James Gorman, Mgr. Nitrogen Dept.; John C. Bennett, Mgr. Phosphate Dept.; R. W. Yoder, Mgr. Insecticide Dept. Plants at: Brewster, Fla.; Warners, N. J.; Niagara Falls & Port Robinson, Ont., Can. (mfg. fertilizers, insecticides, defoliant, herbicides & fungicides.)

The Baker Castor Oil Co.

120 Broadway; tel: DI 9-0500. I. M. Colbeth, Pres.; H. H. Fritts, Dir. Sales.; F. J. Kelly, Castor Pomace Sales. Plants at: Los Angeles, Calif.; Bayonne & Jersey City, N. J.

The Calunite Corp.

Executive offices only. 9 Rockefeller Plaza (Zone 20). Bradley A. Walker, Pres.; J. A. Williams, V.P.; Hugh S. Graham, V.P., Distr. &

Sales; Raymond V. Testa, Controller. (General offices: Altadena, Calif.)

Cornwell Chemical Corp.

24 E. 38th St. Mark Bradley, Pres.; Anthony R. Leto, V.P.; J. P. Bradley, Sec.; Knox B. Phagan, Treas. Plant (sulfuric acid) at Cornwells Heights, Pa.

Davies Nitrate Co., Inc.

144 Liberty St.; tel: REctor 2-6095. T. R. Davies, Pres.; A. J. Wheaton, Jr., V.P.; K. O. Halstead, Sec.-Treas. Plant at Metuchen, N. J.

Fertile Corporation of America

General offices. 251 Central Park, W. (24). E. J. Frank, Pres. Plant at Worthington, Ohio.

Nitrogen Div.—Allied Chemical & Dye Corp.

General offices. 40 Rector St. (6); tel: HANover 2-7300. Hugo Riemer, Pres.; Dr. M. F. Fogler, & F. T. Techter, Exec. V.P.'s; Dr. C. S. Fazel & Jacob White, V.P.'s; J. M. Gaston, Jr., Asst. Sec.; E. F. Fielder, Div. Comp.; G. B. Meredith, Dir. of Prod.; J. J. Porter, Asst. to Exec. V.P.; E. W. Harvey, Dir. of Sales; M. E. Hunter, Asst. Dir. of Sales; R. M. Jones, Dir. of Product Devel.; J. D. Waugh, Dir. of Information; G. W. Suggs, Southern Sales Mgr.; T. C. Rogers, Northern Sales Mgr.; W. H. Mortimer, Mgr. Western Dist. Plants at: S. Omaha, Nebr.; Ironton, Ohio & Hopewell, Va.

Shell Chemical Corp.

Head office—50 W. 50th St. (20). R. C. McCurdy, Pres.; G. R. Monkhouse (San Francisco, Cal.) V.P., Ammonia Div.; C. W. Humphreys, V.P., Mfg.; L. V. Steck, V.P., Mktg.; A. G. Schei, Treas.; G. E. Brewer, Sec.; F. W. Hatch, Mgr. Ag. Chem. Div. (ofc: 460 Park Ave., N. Y. C.); insecticides plant: Denver, Colo.) Ammonia Plants: Pittsburg & Ventura, Calif. (Ammonia Div. ofc: San Francisco, Calif.)

Stauffer Chemical Co.

380 Madison Ave. (17); tel: OXFord 7-0600. (Plant food mfg. facilities supervised by Western Div. ofc., San Francisco, Calif.)

Southwest Potash Corp.

General offices. Tel: BO 9-9290. Heath Steele, Pres.; Thos. W. Childs & T. E. Camp, Jr., V.P.'s Mine at Carlsbad, N. M.

Tennessee Corp.

General offices only. 61 Broadway. E. H. Westlake, Pres.; M. A. Caine, V.P.; J. G. Greenburgh, V.P. & Treas.; B. W. Bellinger, V.P.; Henry Kaufman, Sec. Materials sales office: Atlanta, Ga. Fertilizer Plants: Lockland (Cincinnati), Ohio; New Albany, Indiana; Attalla & Tuscaloosa, Ala.; East Point, Cedartown, Gainesville, Ga. U. S. Phosphoric Products Div., Tampa Fla.

U. S. Industrial Chemicals Co.—Div. National Distillers Products Corp.

99 Park Ave. (16); tel: OXFord 7-0700. Dr. Robert E. Hulse, Gen. Mgr.; L. A. Keane, V.P., Sales; W. E. Johnson, Mgr. Chem. Sales; L. C. Byck, Jr., Asst. Mgr. Chem. Sales. Plant at Tuscola, Ill.

United States Potash Co., Inc.

General office. 30 Rockefeller Plaza (20); tel: COLUMbus 5-5813. Horace M. Albright, Pres.; Dean Gidney,

V.P. & Sales Mgr.; Walter F. Dingley, Sec.-Treas.; John H. Hadfield, Cont. Plant at Carlsbad, N. M.

NORTH COLLINS

CaFP—Coop. G.L.F. Soil Building Service

(Main ofc: Utica, N. Y.) Wm. Mason, Supt. 15,000 t. cap.; 5,000 t. stor. 2 mills, 35 t./hr.; conveyor system; 4 tractor shovels.

ONEIDA

Ca—The Baugh & Sons Co., Inc.

Tel: 1051. (Main ofc: Baltimore, Md.) William H. Bean, Mgr.

PHOENIX

C—The American Agricultural Chemical Co.

P. O. Box 507; tel: 2011. (Main ofc: New York, N. Y.) J. D. McMurray, Mgr.; E. R. Steltzer, Supt.

RIVERHEAD

Atlantic Fertilizer Corp.

P. O. Box 149; tel: PARK 7-4000. William C. Stark, Pres.; Z. R. Hallock, V.P.; Walter E. Stark, Sec.-Treas.

Ca—Long Island Produce & Fertilizer Co., Inc.

General offices. Tel: PARK 7-3100. C. C. Young, Pres.; N. A. Talmage & R. J. Carey, V.P.'s; Geo. Cushman, Treas. & Gen. Mgr.; S. P. Batchelder, Sec. 20,000 tons. 2 Sturdevant mills; 1 Atlanta Utility mill; 6 belt conveyors. Plants also at: Mattituck & Southold, N. Y.

ROCHESTER

CFPb—Gormel Plant Food Products

175 South Ave.; tel: LO 3399. C. J. Gormel, Ptnr. & Pur. Agt.; G. H. Gormel, Ptnr.; Chas. I. Diehl, Plant Mgr. 1,000 t. cap.; 400 t. stor. 1 mill, 20 t./day; mixer; hammermill; 5 elevators; 2 conveyors; tractor.

SOUTHOLD

CG—Long Island Produce & Fertilizer Co., Inc.

(Main ofc: Riverhead, N. Y.)

SPRING VALLEY

CO—Valley Feed & Supply Co., Inc.

Union Rd. at R. R.; tel: 6-0340. George Plitt, Pres.; Rose Plitt, Sec.-Treas. 2,000 t. cap.; 250 t. stor. 3 mixers; elevators; automatic scales.

SYRACUSE

Ca—Syracuse Rendering Co.

2621 Erie Blvd., E.; tel: 72-4491. (Main ofc: Consolidated Rendering Co., Boston, Mass.) A. South, Jr., Plant Mgr. 8,000 t. cap.; 8,500 t. stor. 1 mill, 2 tons; 3 Payloaders; 2 fork lift trucks.

UNION HILL

CPm—Russell Fertilizer Works

Tel: ONtario 3153, Webster 609-J. (Main ofc: Williamson, N. Y.) John Mogyay, Supt. 2,000 t. cap.; 400 t. stor. 1 mill; ½ ton mixer; bulk car unloader; elevator; scales; screens; baggers; hoppers (home made); Link-Belt conveyors.

WILLIAMSON

Ofc.—Russell Fertilizer Works

Ofc: Russell Rd.; tel: 4923. Chas. P. Russell, Pres. & Sec.; J. M. Russell, 1st V.P.; Russell Renscheid, 2nd V.P.; B. C. Russell, Treas. Plant at Union Hill, N. Y.

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
a—ammoniate g—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

NORTH CAROLINA

ACME

API—Acme Fertilizer Co.
(Main ofc: Wilmington, N. C.) T. E. Burns, Supt. 50,000 tons.

ANGIER

C—Jones Fertilizer Co.
J. P. Jones, Owner. 2,000 tons.

CHARLOTTE

L—Alco Liquid Fertilizer Co.
2109 Hutchison Ave.; P. O. Box 1662. Preston I. Delph, Pres.; T. A. Nodell, V.P.; Mrs. R. I. Delph, Treas.; Mrs. Dorothy Sizemore, Sec.; J. L. Bass, Plant Mgr.; Mac Banks, Pur. Agt. 35,000 gal.

A—Planters Fertilizer & Phosphate Co.
P. O. Box 1788. (Main ofc: Charleston, S. C.) Homer N. Wright, Plant Mgr. 30,000 tons.

B—F. S. Royster Guano Co.
Rozzells Ferry Rd.; P. O. Box 2122. (Main ofc: Norfolk, Va.) R. A. Parnell Supt.

B—Virginia-Carolina Chemical Corp.
Tel: EDison 3-3344. (Main ofc: Richmond, Va.)

CLINTON

Ca—Ross Fertilizer Co.
528 East Blvd.; P. O. Box 69; tel: 2966. G. R. Ross & Clarence Kirven, Jr., Ptnrs.; C. C. Barefield, Plant Mgr. 5,000 t. cap.; 5,000 t. stor. 1 mill.

DAVIDSON

CF—The Southern Cotton Oil Co.
P. O. Box 98; tel: 2021. (Main ofc: New Orleans, La.; dist ofc: Columbia, S. C.) W. A. Thompson, Mgr.

DUNN

CPb—Johnson Cotton Co.
N. M. Johnson, Pres.; W. J. Thompson, V.P.; W. G. Smith, Sec.-Treas.; Earl West, Plant Mgr. 15,000 tons. Plant also at Wilmington, N. C.

DURHAM

A—Virginia-Carolina Chemical Corp.
Tel: 3-5841. (Main ofc: Richmond, Va.)

EDENTON

CaHPbm—Home Feed & Fertilizer Co., Inc.
W. Carteret; P. O. Box 183; tel: 66. John G. Wood, Pres. & Treas.; Lelia B. Wood, V.P.; J. G. Wood, Jr., Sec.; Roy H. Spruill, Plant Mgr. & Pur. Agt.; 10,000 t. cap.; 3,000 t. stor. 1 mill. 15 t./hr.; mixer, 1 ton; overhead conveyor; unloading conveyor; Payloader.

ELIZABETH CITY

Ca—Ball Fertilizer Co.
P. O. Box 274; tel: 4690. C. L. Ball, Jr., Ptnr.; J. W. Ball, Active Ptnr. & Plant Mgr. 6,000 t. cap.; 2,300 t. stor. 1 mill, 1 ton Ransome; Corrigan belt conveyor; 2 Hough Payloaders; Tyler screen; Bradley pulverizer; 65 ft. elevator; solution measuring tank; Exact Weight scale; bagging sewing machine.

FAIRMONT

CaFHPbm—Master Chemical Corp.
James A. Hunter, Pres. & Mgr.;

Marvin Giles, Jr., Sec.-Treas., James Watts, Jr., V.P.; Kial Britt, Plant Mgr. 5,000 t. cap.; 2,500 t. stor. 1 mill, ½ ton; Payloader.

FARMVILLE

CPm—Farmville Oil & Fertilizer Co.
600 W. Pine St.; P. O. Box 518; tel: 3183. J. Irvin Morgan, Jr., Pres. & Plant Mgr.; F. F. Jeter, V.P.; W. A. Pollard, Jr., Sec.; F. S. Moore, Treas. & Asst. Sec.; Harry V. Dixon, Supt. 20,000 t. cap.; 7,500 t. stor. 2 mills, 30-40 t./hr.; tractors; conveyors.

FAYETTEVILLE

Ca—The Eastern Guano Co., Inc.
P. O. Box 811; tel: 2-2564. R. J. Boaz, Gen. Mgr.; E. A. Adams, Supt. 6,000 t. cap.; 2,000 t. stor. 1 mill; Hough HA Payloader.

FREMONT

C—Fremont Oil Mill Co.
J. B. Lane, Pres.; E. R. Lane, V.P.; Mrs. P. L. Hayes, Sec.-Treas.; W. R. Jones, Plant Mgr.; Bill Alcroft, Prod. Mgr. 5-10,000 tons. 2 mills, mix 250-300 tons in 8-10 hrs.; belt conveyor.

GIBSON

C—The Southern Cotton Oil Co.
Tel: 2681. (Main ofc: New Orleans, La.; dist ofc: Columbia, S. C.) A. J. Gardner, Mgr.

GOLDSBORO

C—The Southern Cotton Oil Co.
P. O. Box 564; tel: 196, LD26. (Main ofc: New Orleans, La.) W. V. Westmoreland, Dist. Mgr. Dist ofc. for mfg. at: Goldsboro, Rocky Mount & Wilson, N. C.

CF—Well's Fertilizer Works, Inc.
Ofc: 119-133 Center St.; plant: 910 N. James St.; P. O. Box 579; tel: 2800; plant tel: 68. Frank Seymour, Pres.; Abram Weil, V.P.; Henry Weil, Sec.-Treas.; W. D. Edwards, Plant Supt. 10,000 t. cap.; 4,000 t. stor. 2 1-ton mills. 20 t./hr. each; overhead belt conveyors.

GREENSBORO

A—The American Agricultural Chemical Co.
P. O. Box 1139; tel: 2-0173. (Main ofc: New York, N. Y.) Y. C. Hines, Mgr.; G. D. Littlejohn, Supt.

A—Armour Fertilizer Works
Meadowview Rd.; P. O. Box 900; tel: 2-3538, 3-4459. (Main ofc: Atlanta, Ga.) Harry H. Kemp, Div. Mgr.

C—Swift & Co.—Plant Food Div.
Randolph Ave. Extension; tel: 5-2536. (Main ofc: Chicago, Ill.) W. H. Parker, Mgr.

GREENVILLE

CFGpbf—Blount Fertilizer Co.
Tel: 2547. J. H. Blount, Pres.; F. L. Blount, V.P.; A. R. Barrett, Treas.; M. K. Blount, Sec.; C. R. Wright, Plant Mgr.; J. H. Blount, Jr., Pur. Agt. 16,000 tons. 1 mill; completely mechanized with Atlanta Utility equipment.

HENDERSON

C—The American Agricultural Chemical Co.
P. O. Box 690; tel: 4628. (Main ofc: New York, N. Y.) W. H. Masters, Mgr.; S. B. Harris, Supt.

KINSTON

C—Smith-Douglass Co., Inc.
West Bright St.; P. O. Box 596. (Main ofc: Norfolk, Va.) E. B. Peacock, Branch Mgr.

LAURINBURG

BaFH—Dixie Guano Co., Inc.
123 Fairly; P. O. Box 152; tel: 63. Edwin Pate, Pres.; W. M. Campbell, Sec.-Treas.; C. L. Durham, Supt. 3 mills; batch hopper system; 3 belt conveyors; Payloaders.

LUMBERTON

CFPI—Farmers Cooperative Exchange
(Main ofc: Raleigh, N. C.) 2 mills.

CaH—Robeson Manufacturing Co.
Maxton Rd.; P. O. Box 1096; tel: 4644. Edwin Pate (Laurinburg, N. C.), Pres.; F. K. Biggs, Sr. V.P.; T. E. Holliday, Treas. & Gen. Mgr.; Mrs. M. R. Butler, Sec.; Lacy H. Davis, Supt. 6,000 tons. 1 mill; Payloaders; conveyor belts.

MATTHEWS

C—I. G. Wallace & Son
Rt. 1; tel: (Charlotte) EDison 3-9338. J. L. Wallace, Ptnr. & Mgr. 40 tons per day.

MAXTON

CaH—Maxton Oil & Fertilizer Co.
Tel: 1. E. H. Evans, Pres.; J. D. Medlin, V.P., Treas., Prod. Mgr. & Pur. Agt.; Mayme McQueen, Sec.; E. L. Taylor, Supt. 5,000 t. cap.; 500 t. stor. 1 mill; hopper systems; tractor shovels.

MOUNT OLIVE

C—Ricks Fertilizer Co.
T. Nelson Ricks, Pres.; Edgar N. Ricks, V.P.; Wm. F. Ricks, Sec.-Treas. 4,000 tons.

NAVASSA

A—Armour Fertilizer Works
P. O. Box 1380 (Wilmington); tel: 5271, 5272, 7225. (Main ofc: Atlanta, Ga.) F. L. Wooten, Jr., Div. Mgr.

C—F. S. Royster Guano Co.
P. O. Box 1379 (Wilmington). (Main ofc: Norfolk, Va.) A. E. Burnette, Supt.

NEW BERN

Baugh & Sons Co.
Tel: 4145. (Main ofc: Baltimore, Md.) G. Allen Ives, Div. Sales Mgr.

CFH—Dixie Chemical Corp.

P. O. Box 667; tel: 2002, 6380. Leo H. Harvey, Pres.; N. S. Stokes, V.P.; C. Felix Harvey, III, V.P.; D. C. Flowers, Sec.-Treas.; Kirby G. Johnson, Supt. 30,000 t. cap.; 18,000 t. stor. 2 mills, 40 t./hr.; hopper systems; conveyors; tractor shovels; sewing machines.

CaPbm—New Bern Oil & Fertilizer Co.

John S. Weskett, Pres.; H. G. Swan, A. V. Thomas & F. H. Bailey, V.P.'s; W. W. McCotter, Sec.-Treas.; H. O. Williams, Asst. Sec.-Treas.; Alton R. Lamm, Supt. 25,000 tons. 2 mills, 300 t./day; Batchmaster; 8 Hough Payloaders.

NEWTON

C—Newton Oil & Fertilizer Co.
J. W. Abernethy, Pres.; H. L. Arndt, V.P.; F. F. Schrum, Sec.-Treas.; Lell Setzer, Plant Mgr. 2,500 tons.

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
S—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

PINE LEVEL

Ca—The Pine Level Oil Mill Co.

P. O. Box 48; tel: 2152. Doc. R. Oliver, Pres. & Mgr.; D. Buren Oliver, V.P.; R. E. Oliver, Sec.-Treas.; A. H. Wilkins, Supt. 10,000 t. cap.; 5,000 t. stor. 1 mill, 100 t./day; 2 Hough Payloaders; conveyor system.

RALEIGH

CDEF1—Farmers Cooperative Exchange

General offices. 121 E. Davie St.; tel: 3-4646. H. C. Ferebee (Camden, N. C.), Pres.; M. G. Mann, Sec. & Gen. Mgr.; G. D. Arndt, Treas. & Asst. Gen. Mgr.; V. D. Estes, Dir. FCX Fert. Service. Plants at Lumberton & Salisbury, N. C.

CF—Robertson Chemical Corp.

Foot S. Blount St.; Box 68; tel: 4-3431. (Main ofc: Norfolk, Va.) S. N. Carroll, Mgr. 10,000 tons.

RED SPRINGS

CaFHPbm—Liberty Manufacturing Co.

Edwin Pate, Pres.; E. H. Evans, V.P.; G. T. Ashford, Sec.-Treas.; James I. Owens, Plant Mgr.; D. R. Hall, Jr., Mgr. Pest. Div. 7,500 t. cap.; 3,000 t. stor. 1 mill, 30 t./hr.; hopper system; overhead trolley conveyor; automatic scales; 3 tractor shovels; fork lift.

ROCKINGHAM

CaFHP—McLaurin's, Inc.

P. O. Box 869; tel: 4662. E. Bert McLaurin, Pres.; Joe M. McLaurin, V.P.; J. H. Gibson, Asst. Sec.-Treas. & Mgr. Pest. Div. Harry L. Jeffords, Supt. 6,000 t. cap.; 1,000 t. stor. 2 Payloaders.

ROCKY MOUNT

CGHI—Planters Cotton Oil & Fertilizer Co.

1004 Cokey Rd.; P. O. Box 912; tel: 2-2131. R. D. Gorham, Pres.; W. M. Daughtridge, J. D. Robbins, W. T. Melvin, G. W. Gorham, Jr. (Prod. Mgr.), V.P.'s; J. L. Murphy, Treas.; T. H. Pitt, Sec.; C. J. Raynor, Supt.; B. B. Woodard, Mgr. Pest. Div. 1 mill, 1½ tons; hopper system; belt conveyors; Payloaders; fork lifts.

C—The Southern Cotton Oil Co.

P. O. Box 109; tel: 2-3165, L.D. 2-3166. (Main ofc: New Orleans, La.; dist ofc: Goldsboro, N. C.) J. E. Lambert, Jr., Mgr.

ROXBORO

Ca—Camp Chemical Co., Inc.

Camp St.; P. O. Box 420; tel: 4673. J. O. Watts, Jr., Pres.; Harvey Sears, V.P.; M. M. Giles, Jr., Sec.-Treas.; Thomas R. Bennett, Mgr.; C. P. Perkins, Supt. 10,000 t. cap.; 4,200 t. stor. 1 mill, 1 ton.

SALISBURY

C—Cooperative Fertilizer Service, Inc.

P. O. Box 1468; tel: 3772. (Main ofc: Farmers Cooperative Exchange, Raleigh, N. C.) B. A. Weddington, Prod. Mgr. 20,000 tons. 1 mill; complete conveyor & hopper system.

SANFORD

Ca—Sapona Mills, Inc.

Box 729; tel: Spring 4-7361. (Shipping point: Monroe Park, N. C.) Mrs. Tempe B. Barringer, Pres.

John Barringer, V.P.; Paul J. Barringer, Sr., Treas.; Ira G. Turnley, Supt. 6,000 t. cap.; 1,200 t. stor. 1 mill; 1-ton mixer with special sacking equipment; dump scales; power shovel; conveyor system from mixer to storage piles.

SCOTLAND NECK

Ca—Shields Co.

P. O. Box 365; tel: 222-1. Frank P. Shields, Owner & Mgr.; S. F. Johnson, Supt. 5,000 t. cap.; 1,300 t. stor. 1 mill, 20 t./hr.; HA Payloader.

SELMA

A—Virginia-Carolina Chemical Corp.

Tel: 2184. (Main ofc: Richmond, Va.)

SHELBY

C*—D. A. Beam Co., Inc.

P. O. Box 206. Dennis A. Beam, V.P.; Miles A. Beam, Sec.-Treas.; Edwin A. Beam, Gen. Mgr.; A. Pinkney Dedmon, Plant Mgr. 10,000 tons.

CF—The Southern Cotton Oil Co.

P. O. Box 472; tel: 9091, 9092. (Main ofc: New Orleans, La.; dist. ofc: Columbia, S. C.) R. C. Barnett, Mgr.

SMITHFIELD

Ca—Wallace Guano Co.

Truck Lane; Box 147; tel: 2644. Dixon Wallace, Pres.; L. L. Nordan, V.P.; Lawrence H. Wallace, Sec.-Treas. & Pur. Agt.; H. E. Rice, Plant Mgr. 6,000 tons. 1 mill; 1 mixer, 1 ton; belt conveyors from mixer to storage pile; Payloader.

STATESVILLE

CaF—Robertson Chemical Corp.

Hwy. 70 S. E.; P. O. Box 1163; tel: 3994. (Main ofc: Norfolk, Va.) W. E. DeJarnette, Mgr.; M. K. Brown, Supt. 50,000 tons.

WADESBORO

C—Virginia-Carolina Chemical Corp.

Tel: 366. (Main ofc: Richmond, Va.)

CaFH—Wadesboro Fertilizer Co.

P. O. Box 384; tel: 275. R. T. B. Little, Mgr. 30 t./hr.; Payloaders.

WARRENTON

C—Warren Cotton & Fertilizer Co., Inc.

Tel: 263-1. H. W. Rodwell, Pres.; C. E. Rodwell, Sec.-Treas. & Pur. Agt.; J. Perry Twitty, Supt. 3,000 t. cap.; 500 t. stor. 1 mill, 1 ton; 25 ft. belt conveyor.

WAYNESVILLE

Ca—Smoky Mountains Fertilizer Co.

P. O. Box 670; tel: GLendale 6-6321. C. G. Thompson, Pres. & Treas.; J. W. Rutland, V.P. & Sec.; E. N. Kimbrough, Supt. 18,000 t. cap.; 5,000 t. stor. 2 mills, 1 & 1½ tons; basing unit.

E—Western Carolina Phosphate Co.

P. O. Box 670; tel: GLendale 6-6321. J. W. Rutland, Pres. & Treas.; C. G. Thompson, V.P. & Sec.; E. N. Kimbrough, Supt. 30,000 tons superphosphate; 5,000 t. stor. Belt conveyors; 16 ton mechanical den; automatic drag line.

WHITEVILLE

Ca—Reliance Guano Co., Inc.

410 E. Main St.; tel: 2326. (Wholly owned subsidiary of Southern States Phosphate & Fertilizer Co., Savannah, Ga.) F. R. Dulany, Pres.

& Treas.; W. H. Read, V.P.; Mrs. Mary D. Lovett, Sec.; C. D. Henderson, Plant Mgr. 12,000 t. cap.; 8,000 t. stor. 1 mill, 1½ tons; conveyor system; 3 tractor shovels.

WILLIAMSTON

CaPfm—Olin Mathieson Chemical Corp.—Eastern Fertilizer Div.

P. O. Box 390. (Main ofc: Baltimore, Md.) C. G. Crockett, Southeast Dist. Mgr.

WILMINGTON

Acme Fertilizer Co.

Office. Acme Bldg.; P. O. Box 330; tel: 2-3361. Thomas H. Wright, Jr., Pres.; L. P. Campbell, V.P.; N. J. Kelly, Treas.; W. Clark Bellamy, Mgr. Pesticide Div. Plant at Acme, N. C.

CaPfm—Davison Chemical Co.—Div.

W. R. Grace & Co. Ofc: 209 Southern Bldg.; Plant; North of City; P. O. Box 180; tel: 6621. (Main ofc: Baltimore, Md.) J. M. Blass, Mgr.

Ca—International Minerals & Chemical Corp.

P. O. Box 1886; tel: 6058, L.D. 21. (Main ofc: Chicago, Ill.) J. F. Carroll, Dist. Sales Mgr.; J. B. Vanderver, Supt.

Ca—Josey Fertilizer Corp.

P. O. Box 1259; tel: 7673. (Main ofc: Dunn, N. C.) N. C. Littlejohn, Supt. 35,000 t. cap.; 20,000 t. stor. 3 mills, 50 t./hr.; 9 tractors; 3 conveyors.

Ca—Pearsall & Co.

P. O. Box 626; tel: 9863. J. W. Smith, Pres.; Melzar Pearsall, Jr. & Oscar Pearsall, V.P.'s; M. W. Pearsall, Sec.; J. E. Benton, Supt. 20,000 t. cap.; 7,500 t. stor. 2 mills.

C—Robertson Chemical Corp.

Tel: 5258. (Main ofc: Norfolk, Va.) R. V. Fulk, Mgr.; J. C. Frye, Supt. 50,000 tons.

C—Smith-Douglass Co., Inc.

P. O. Box 456. (Main ofc: Norfolk, Va.) J. J. Pointer, Branch Mgr.

A—Swift & Co.—Plant Food Div.

P. O. Box 210; tel: 4476. (Main ofc: Chicago, Ill.) J. S. Zapf, Mgr.

A—Virginia-Carolina Chemical Corp.

Tel: 7717 & 7718; factory tel: 7963. (Main ofc: Richmond, Va.)

Ca—Wilmington Fertilizer Co.

Box 700; tel: 3-2487. Edwin Pate, Pres.; Herman N. Hayden, V.P. & Treas.; R. M. Padrick, Jr., Sec.; George Sloan, Jr., Supt. 40,000 t. cap.; 20,000 t. stor. 3 mills, 40 t./hr.; hopper system; complete conveyor system throughout plant; Payloaders, etc.

WILSON

Ba—Contentnea Guano Co.

Box 1016; tel: 2636. A. B. Farmer, (Bailey, N. C.), Pres.; Irvin Morgan, Jr., V.P. & Gen. Mgr.; H. W. Cannon, Supt. 40,000 t. cap.; 20,000 t. stor. 3 mills, 400 t./day; belt conveyors; hopper system; tractors; power shovels.

B*—Farmers Cotton Oil Co.

510 E. Barnes St.; P. O. Box 980; tel: 2154. T. F. Bridgers, Pres.; C. P. Harris, V.P.; Jno. L. Day, Sec.; E. R. Bridgers, Asst. Sec.; H. M. Rogers, Treas.; C. M. Kirby, Asst. Treas.; W. G. Bryant, Supt. & Eng.

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
a—ammoniate g—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

50,000 tons. Plant also at Norfolk, Va.

C—The Southern Cotton Oil Co.
P. O. Box 698; tel: 3146, 3147. (Main ofc: New Orleans, La.; dist ofc: Goldsboro, N. C.) A. H. Wells, Mgr.

WINSTON SALEM

C—International Minerals & Chemical Corp.
P. O. Box 4145; tel: 3-7683. (Main ofc: Chicago, Ill.) Frank Kimbrough, Supt.

Bag—Weaver Fertilizer Co.
N. Cherry St. Ext.; tel: 2-1359. (Main ofc: Norfolk, Va.) J. E. Landers, Plant Mgr. 30,000 t. cap.; 10,000 t. stor. 2 mills, 300 t./day; 2 tractor shovels.

NORTH DAKOTA

FARGO

Bag—Peavey Fertilizer Plant—Branch of Peavey Elevators, Country Div. F. H. Peavey & Co.
1817 Great Northern Dr.; P. O. Box 1916; tel: 2-2401. David A. Williams, Plant Mgr. & Pur. Agt. 25,000 tons. 1 mill, 30 tons per hr.; hopper system; automatic weigh; bulk conveyors including Craneveyor; bag conveyors for car & truck loading.

GRAND FORKS

CagFPm—Agasco Chemicals, Inc.
700 N. 3rd St.; P. O. Box 351; tel: 4-5325. L. A. Brown, Pres. Plant Mgr. & Pur. Agt.; C. W. Sande, V.P. 15,000 t. cap.; 5,000 t. stor. Conveyor system; 2 Hough Payloaders.

CagPm—The Summers Fertilizer Co., Inc.
Hwy. 81 North; P. O. Box 545; tel: 4-4638. (Main ofc: Baltimore, Md.) W. A. Rasmussen, Mgr. 30,000 t. cap.; 20,000 t. stor. 2 mills, 30 t./hr.; conveyors; tractor shovels, etc.

OHIO

ALLIANCE

Ca—Davison Chemical Co.—Div. W. R. Grace & Co.
West of City; P. O. Box 599; tel: 2297. (Main ofc: Baltimore, Md.) M. C. Evans (Columbus, O.) Mgr.; G. Round, Supt.

C—The Farm Bureau Cooperative Assn., Inc.
(Main ofc: Columbus, Ohio.)

BELLEVUE

C—Wm. C. Horn, Inc.
Wm. C. Horn, Pres., Treas. & Plant Mgr.; Florence E. Horn, V.P. & Sec.; Malenda E. Gage, Asst. Sec. 2,500 t. cap.; 1,250 t. stor. 1 mill; hopper; tractor; overhead carrier.

CAIRO

B—The American Agricultural Chemical Co.
P. O. Box 158 (Lima, Ohio). (Main ofc: New York, N. Y.) J. C. Sliger, Mgr.; D. C. Rapalje, Supt.

CANTON

C—Baugh & Sons Co. of Ohio
Tel: 2-0406. (Main ofc: Baltimore, Md.) C. L. Thompson, Mgr.

CAREY

O—Organic Products Div.—Smith Agricultural Chemical Co.
R.R. 2; P. O. Box 155; tel: 6-4129. (Main ofc: Columbus, Ohio) W. W. Clark, Jr., Plant Mgr. Humus filler: 17,000 t. cap.; 1,100 t. stor. 2 60 ft. Louisville rotary dryers; 2 Jeffrey Spiral conveyor hoppers; 3 Jeffrey chain conveyors; 2 L-B vibrating screens; 1 Hanson shovel; 2 Plymouth gas loco's.

CHILLICOTHE

CaPm—Scioto Farm Chemicals, Inc.
Rte. 4; tel: 3-0803. Kenneth Conard, Pres. & Pur. Agt.; Dwight W. McCalla, V.P.; Donald L. Conard, Sec. & Plant Mgr.; George Elsass, Treas. 10,000 t. cap.; 1,300 t. materials stor., 1,200 t. mixed goods stor. 1 mill, 20 t./hr.; 1 receiving elevator; 4 belt conveyors (2 stationary, 2 shuttle); 1 Stedman mixer; 2 Stedman screens; 2 Stedman pulverizers; mixed goods elevator; 1 shipping elevator; Exact Weight baggers; 1 Hough Payloader. (Plan granulator unit.)

CINCINNATI

A—The American Agricultural Chemical Co.
Vine St. & B. & O. R.R.; P. O. Box A, St. Bernard Sta.; tel: AVon 0836 (sales) & 2250 (works). (Main ofc: New York, N. Y.) H. O. Beatty, Mgr.; A. B. Rusche, Supt.

B—Armour Fertilizer Works

5184 Broerman Ave. (17); tel: AVon 2924. (Main ofc: Atlanta, Ga.) J. G. Bryant, Div. Mgr.

Aa—International Minerals & Chemical Corp.

P. O. Box 67, Lockland Sta.; tel: VAlley 1-3570 (ofc.) & 1-7778 (plant). (Main ofc: Chicago, Ill.) C. A. Willenbrink, Supt.

Ba—Tennessee Corp.

Glendale-Milford Rd. (15); tel: PR 1-7653. (Main ofc: New York, N. Y.) R. W. Alexander, Gen. Mgr. 100,000 tons. 6 mills, 40 t./hr.; clam shell bucket cranes; Hough Payloaders; conveyors.

A—Virginia-Carolina Chemical Corp.
St. Bernard; tel: AVon 1935 & 1936; factory tel: AVon 1-6556 & 1-6557. (Main ofc: Richmond, Va.)

CLEVELAND

A—The American Agricultural Chemical Co.

4600 W. 140th. St., West Park Sta. (11); tel: ORchard 1-1990. (Main ofc: New York, N. Y.) Bernard Eiselstein, Mgr.; H. B. Houghtaling, Supt.

C—The Stadler Fertilizer Co.

1010 Denison Ave. (9); tel: ONtario 1-6400. W. W. Johnson, Pres., Treas. & Gen. Mgr.; O. C. Herest, V.P. & Sec.; V. E. Winans, V.P., Sales; M. Straus, Supt. 25,000 t. cap.; 8,500 t. stor. 2 mills, 30 t./hr.; batch mixers; conveyors; tractors; lift trucks.

B—Swift & Co.—Plant Food Div.

P. O. Box 2740, West Park Sta. (11); tel: CLearwater 1-5500. (Main ofc: Chicago, Ill.) R. A. Culbertson, Mgr.

COLUMBUS

Bag—Davison Chemical Co.—Div. W. R. Grace & Co.

Ofc: 918 Atlas Bldg. (15); Plant: 3355 E. 5th Ave.; tel: CApiital 4-7239. (Main ofc: Baltimore, Md.) M. C. Evans, Mgr.

The Farm Bureau Cooperative Assn., Inc.

General offices. 245 N. High St. (16); tel: CApiitol 1-1141. W. N. Woods, Pres.; H. D. Heckathorn, V.P.; K. N. Probasco, Treas.; R. E. Gibbs, Sec.; W. W. Wilson, Pur. Agt.; Robt. A. Garn, Mgr. Fert. Mfg. Div. Plants at Alliance, Dayton, Glendale, Maumee & Marietta, Ohio.

Aa—The Farmers Fertilizer Co.

1380 Windsor Ave.; P. O. Box 2002; tel: AX 9-4153. R. K. Cooper, Pres.; H. E. Wood, V.P. & Gen. Mgr.; E. G. Schultz, V.P.; B. P. Redman, Jr., Sec., Pur. Agt., Prod. & Sales Mgr.; M. Y. Cooper, Asst. Sec.; H. E. Wood, Treas. & Pur. Agt.; I. C. Armistead, Asst. Treas.; W. A. Hendrix, Acid Plant Supt.; P. D. Saddler, Fert. Plant Supt. 50,000 tons acid; 50,000 t. fert. cap.; 15,000 t. fert. stor. 2 shipping mills, 35 t./hr.; belt conveyors for both bulk & bagged goods; hoppers used on mixing unit; tractor shovel.

B—Federal Chemical Co.

Bonham Ave.; P. O. Box 178. (Main ofc: Louisville, Ky.) Charles W. Shepherd, Plant Mgr.; A. R. Wagner, Asst. Plant Mgr.; Carl R. Stillings, Sales Mgr.; W. A. Lecureux, Asst. Sales Mgr.

AgF—The Smith Agricultural Chemical Co.

General offices. 618 N. Champion Ave.; P. O. Box 1379; tel: FA 1115. W. F. Farley, Pres.; Nelson T. White, V.P.; C. S. Schmelzer, Treas.; Carl E. Veth, Sec.; Earl F. Cline, Plant Mgr. 50,000 t. cap.; 35,000 t. stor. 1 mill, 25 t.; 1 rock mill; 1 mixing or manipulator mill; 5 bagging mills; 125 t./hr.; 1 bulk mill; full Jeffrey & Columbus conveyor system; hopper system; elevators; tractor shovels. Plants also at: Indianapolis, Ind.; Holland & Saginaw, Mich.; Carey, Ohio.

SCoLPf—Stim-U-Plant Laboratories Co.

2077 Parkwood Ave.; tel: AM 7-1297. T. P. Harrington, Pres.; Ed Cheek, Gen. Mgr.; N. Standard, Plant Mgr.; Paul Clemens, Sales Mgr. High-analysis soluble & dry mixes for home use.

COPLEY

S—Hydroponic Chemical Co., Inc.
Tel: MOntrorse 6-6011. J. D. Oatts, Pres.; C. A. Doering, Sec. & Plant Mgr. Specialty fertilizers.

DAYTON

O—City of Dayton—Div. Sewage Treatment

Guthrie Rd. (plant); 309 Municipal Bldg. (ofc.); tel: HEMlock 1941. L. C. Huffman, Dir. Dept. Water; L. T. Hagerty, Plant Supt. 3,000 t. cap.; 200 t. stor. Dry grind & bag (or skip bulk) sludge as soil conditioner.

C—The Farm Bureau Cooperative Assn., Inc.

(Main ofc: Columbus, Ohio)

Cg—The Miami Fertilizer Co.

Box 97, Dabel Branch (10); tel: (Xenia) 2-4467; Factory & offices at Trebein (Green County), Ohio. C. R. Martin, Pres.; Charles F. Martin, V.P. & Gen. Mgr.; Clarence D. Crickmore, Plant Mgr. 25,000 t. cap.; 7,000 t. stor. Conveyors; tractor shovels.

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
s—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

FINDLAY

Cag—Davison Chemical Co.—Div. W. R. Grace & Co.
West of City; P. O. Box 87; tel: 2630. (Main ofc: Baltimore, Md.) M. C. Evans (Columbus, O.), Mgr.; Carl Alkire, Supt.

FOSTORIA

C—Baugh & Sons Co. of Ohio
Tel: 3818. (Main ofc: Baltimore, Md.) S. R. Babylon, Mgr.
CagFP—The Ohio Farmers Grain & Supply Assn.
550 W. 4th St.; tel: 7768. A. J. Koppenhafer, Pres.; Alfred P. Eier, V. P.; S. E. Salisbury, Sec.-Treas.; Earl Neuman, Plant Supt. 15,000 t. cap.; 5,000 t. stor.; Stedman mill, 1 ton; complete batch weigh hoppers & belt conveyors, Stedman.

GIBSONBURG

CFPfm—Gibsonburg Coal & Fertilizer Co.
W. Stone St.; P. O. Box 93; tel: 3993. D. D. Younker, Owner & Mgr. 4,000 t. cap.; 1,500 t. stor. 1 mill, 1 ton; 2 Payloaders; screw & flight conveyors.

GLENDALE

C—The Farm Bureau Cooperative Assn., Inc.
(Main ofc: Columbus, Ohio.)

GREENVILLE

C—Swift & Co.—Plant Food Div.
Box 138; tel: 1362, 1363. (Main ofc: Chicago, Ill.) P. E. Nordaker, Mgr.

IRONTON

CE—Nitrogen Div.—Allied Chemical & Dye Corp.
P. O. Box 98; tel: 8-4321. (Main ofc: New York, N. Y.) C. W. Bahrt, Jr., Mgr. Ammonia, nitrogen fertilizer solutions, urea, 12-12-12 complete fertilizer.

MARIETTA

LPhf—American Liquid Fertilizer Co., Inc.
2nd St. at St. Clair; P. O. Box 267; tel: 2511, 2512. Ernst Whitaker, Pres., Treas. & Pur. Mgr.; Mrs. H. M. Whitaker, V.P.; Andrew L. Roddy, Sec.; Herbert Warden, Plant Mgr. 100,000 gal. liqd. fert. Rapids-Standard conveyor; Chrisholm-Moore Mansaver grab; Yale hoist for loading & unloading. (Company concern Rokeby Chemical Co., at same location formulates insecticides & herbicides, distributes fungicides.)

C—The Farm Bureau Cooperative Assn., Inc.
(Main ofc: Columbus, Ohio.)

MARION

CagF—Marion Plant Life Fertilizer Co.
West Center at Nye St.; tel: 2-6111. George H. Alber, Pres. & Pur. Agt.; John Lockstead, Plant Mgr.; Fred Joerger, Prod. Mgr. 18,000 t. cap.; 9,000 t. stor. 1 mill, 10 tons per hr.; belt conveyors.

CL—“Na-Churs” Plant Food Co.
421 Monroe St.; tel: 2-1194. B. Peterson, Chmn. of Board; H. A. Petrich, Pres. & Pur. Agt.; T. L. Martin, V.P.; R. L. Morgan, Treas.; John D. House, Adv. Mgr.; R. A. Bagley, Sales Mgr.; P. A. Peterson, Prod. Mgr. 5,000 tons.

MARYSVILLE

CPm—O. M. Scott & Sons Co.
6th St.; tel: LD 66. C. B. Mills, Pres.;

H. C. Doellinger, Prod. Mgr. 15,000 tons.

MAUMEE

CPm—The Farm Bureau Cooperative Assn., Inc.
Monclova Rd.; P. O. Box 115; tel: 3-2212. Theodore Clapp, Plant Mgr. 26,000 t. cap.; 6,600 t. stor. Tractor shovels.

NAPOLEON

CaF—Midwest Plant Food, Inc.
Scott St.; P. O. Box 442; tel: 7061. Wilbur H. Kleck, Pres.; Louis E. Frank, V.P., Plant Mgr. & Pur. Agt.; John A. Peiblow, Sec.-Treas. 20,000 t. cap.; 7,000 t. stor. 1 mill, 30 t./hr. Stedman complete conveyor & hopper system; Hough Payloaders; St. Regis Packer.

OTTAWA

CaP—The Diamond Fertilizer Co.
(Main ofc: Sandusky, Ohio) Robert Simcox, Sales Mgr.; Melvin Brinkman, Supt.; Tom Hill, Plant Mgr. 24,000 t. cap.; 4,000 t. stor. 1 mill, ½ ton; hopper system; conveyors; tractor shovels; automatic bagger, 35 t./hr.

ST. PARIS

CAF—The Green Belt Chemical Co.
Tel: 4241. M. K. Miller, Pres.; E. H. Sundermann, V.P.; N. E. Miller, Sec. - Treas.; Phillip W. Pettett, Plant Mgr. 10,000 t. cap. Hopper system; conveyors; tractor shovels.

SANDUSKY

A—Armour Fertilizer Works
1509 1st St.; P. O. Box 509; tel: 86, 87. (Main ofc: Atlanta, Ga.) R. G. Crammond, Div. Mgr.
Aa—Diamond Fertilizer Co.
1517 5th St.; P. O. Box 1561; tel: 750. Howard C. Fisher, Exec. V.P. & Treas.; Howard K. Morgan, V.P., Sec. & Pur. Agt.; Thomas Hill, Plant Mgr. 60,000 tons. Plant also at Ottawa, Ohio.

SILICA

B—E. Rauh & Sons Fertilizer Co.
Mailing address: Rte. 1, Sylvania, Ohio; tel: (Sylvania) 2-2003. (Main ofc: Indianapolis, Ind.) A. C. Pilikerd, Supt. 50,000 t. cap.; 18,000 t. stor. 1 batching mill, 40 t./hr.; Hough Payloaders; Hyster load dispatchers.

TOLEDO

A—F. S. Royster Guano Co.
Creekside Rd.; P. O. Box 68, W. Toledo Sta. (Main ofc: Norfolk, Va.) Alex Cohen, Supt.
O—Toledo Div. Sewage Disposal
Bay View Park. A. H. Niles, Engr. Supt. 1,200 tons sewage sludge.

The Woodville Lime Products Co.
Office. 2140 Jefferson Ave (2); tel: MAin 1291. Geo. C. Urschel, Pres.; Dr. C. R. Rex, V.P.; Geo. C. Urschel, Jr., V.P. & Plant Mgr.; J. Robert Cowell, Treas.; Thomas J. Dolan, Sec. Plant at Woodville, Ohio.

WASHINGTON COURT HOUSE

B—The American Agricultural Chemical Co.
P. O. Box 68. (Main ofc: New York, N. Y.) A. F. Vetter, Supt.

WEILERSVILLE

CF—Tyler Grain & Fertilizer Co.
Tel: 55 & 56. (Office at Wooster, Ohio) Donald Hartzler, Supt. 10,000 tons. 1 Stedman mill, 1 ton

(15 t./hr.); 1 bulk bin conveyor; 1 tractor scoop.

WOODVILLE

C—The Woodville Lime Products Co.
P. O. Box 125; tel: 2351. (Main ofc: Toledo, O.) Geo. C. Urschel, Jr., Plant Mgr.; Ross W. Kreager, Supt.; Chester Mathna, Supt. Fert. Div. 20,000 t. cap.; 2,500 t. stor. 1 mill.

WOOSTER

Tyler Grain & Fertilizer Co.
619 Madison Ave.; tel: AN 3-4055. Walter F. Tyler, Pres., Treas. & Gen. Mgr. Portia Armstrong, Sec. Plant at Weilersville, Ohio.

WORTHINGTON

L—Fertile Corp. of America
966 Proprietors Rd.; P. O. Box 254; tel: FR 2-5173. (Main ofc: New York, N. Y.) James L. Smith, Plant Mgr. 75,000 gal.
SC—Slemmons Gardens
5256 Olentangy River Rd.; tel: AM 2-3631. E. Bret Slemmons, Gen. Mgr. Mfg. water-soluble dry fertilizers; 2 t. cap.; 2 t. stor.

OKLAHOMA

BARTLESVILLE

BCag—Crawford Chemical Co., Inc.
Drawer 309; tel: 6205. H. F. Hedges, Pres.; W. A. Rigg, V.P.; Julia L. Moore, Sec.-Treas.; H. H. Barnes, Plant Mgr. 30,000 t. cap.; 8,000 t. stor. 3 mills; hopper system; conveyors; granulators; screens; automatic sackers.

E—Phillips Chemical Co.

Adams Bldg.; tel: 6600. K. S. Adams, Chmn. Board Dir.; Paul Endacott, Pres.; Stanley Learned, Chmn. Exec. Comm. & Asst. to Pres.; W. W. Keeler, V.P.; G. W. McCullough, V.P. & Chmn. Oper. Comm.; T. L. Cabbage, V.P.; & Gen. Mgr.; R. W. Thomas, V.P.; B. F. Stradley, V.P. & Treas.; Rayburn L. Foster, V.P.; C. R. Musgrave, V.P.; R. C. Jopling, V.P.; E. H. Damon, V.P. & Tech. Sales Adv.; Paul J. Parker, Sec. & Asst. Treas.; R. E. Parr, Comp.; W. F. Martin, Asst. Sec. & Asst. Treas. Plants at: Crane, Etter, Goldsmith & Pasadena, Texas; Scottsbluff, Neb.

CHICKASHA

C—Chickasha Cotton Oil Co.
Tel: 2300. C. Britain, Exec. V.P. & Gen. Mgr.; C. R. Van Valkenburgh, V.P., Sales; E. V. Tyrell, Pur. Agt.; D. King, Plant Mgr.

LPf—Southwest Chemical Co.
1600 N. 30th; P. O. Box 3028; tel: AD 7-2233. Leon Cook, Gen. Mgr.; Elmer Koons, Supt. 10,000 t. cap.; 1,200 t. stor. Terminals at Altus, Blackwell, Meno, Kingfisher & Fairview, Okla.

MUSKOGEE

B—Consumers Coop. Assn.
2222 Shawnee; Box 1605; tel: Murray 7-7584. (Main ofc: Kansas City, Mo.) A. R. Shelton, Plant Mgr. 30,000 t. cap.; 10,500 t. stor. 2 mills; Syntron hopper system; belt conveyors; granulation equipment; Payloaders.

OKLAHOMA CITY

OS—National Plant Food Co.
210 W. California St. (2); tel: FOrest 5-7436. Carl G. Horn, H. W. Horn

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
a—ammoniate **g**—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

& Robert D. Horn, Ptnrs.; Charles McGlawn, Plant Mgr. Manure dehydrating plant. 4,000 t. cap.; 1,000 t. stor.

Bg—Nichols Fertilizer & Chemical Co.
 Lecox; P. O. Box 2665, Stockyards Sta. (8); tel: MEIrose 8-6354. Earl Nichols, Pres.; Russell L. Pierson, V.P.; W. Frederick Nichols, Sec.-Treas.; G. E. Tomlinson, Plant Mgr. 40,000 t. cap.; 10,000 t. stor. 3 mills, 13,500 t./yr. ea.; hopper systems; conveyors; tractor shovels; fork lifts.

PRYOR

E—Grand River Chemical Div.—Deere & Co.
 Tel: 4000. (Main ofc: Tulsa, Okla.) W. W. Yeandle, Plant Mgr. Anhydrous ammonia & urea.

TULSA

Bg—Davison Chemical Co.—Div. W. R. Grace & Co.
 West of City; 4900 W. 21st. St.; tel: 3-1585. (Main ofc: Joplin, Mo.) F. C. Moore, Supt.

Grand River Chemical Div.—Deere & Co.
 2010 S. Utica (4); tel: RIVERSide 2-2475. L. A. Rowland, V.P. & Gen. Mgr.; John R. Taylor, Jr., Sales Mgr. Plant at Pryor, Okla.

L—Remwood Chemical Co.
 3824 W. 51st Ct. Dr. Ronald E. Meyer, Pres. & Treas.; Harold S. Wood, V.P. & Sec.

CPi—Shannon Agricultural Laboratories
 300 E. 1st. St.; tel: DIAMOND 3-1163. L. D. Shannon, Owner; C. D. McHargue, Chemist, Mgr. Dry mix equipment.

OREGON

KLAMATH FALLS

CgFHPbm—Simplot Soilbuilders—Div. J. R. Simplot Co.
 2052 Washburn Way; P. O. Box 552; tel: 2-1438. (Main ofc: Pocatello, Idaho) Jack H. Barbour, Mgr.; W. K. Jeffcoat, Mgr. Pest. Div. 5,000 t. cap.; 2,000 t. stor. Bulk handling system; Payloaders.

MADRAS

C—Pacific Supply Cooperative—Chemical Div.
 P. O. Box 803; tel: 2222. (Main ofc: Portland, Oreg.) Willis Freeman, Mgr. 7,000 tons.

MEDFORD

CD—Southern Oregon Sales, Inc.
 S. Hwy. 99 & Stewart Ave.; P. O. Box 1268; tel: 2-6244. Mrs. Marion Riegel, Pres.; S. M. Tuttle, Gen. Mgr.; V. A. Turpin, Asst. Mgr.; Ronald M. James, Prod. Mgr., Pur. Agt. & Mgr. Pesticide Div. 50 t. cap.; 500 t. stor. 1 mixing mill, 10 tons per day; small hopper system; fork lift trucks.

NORTH PORTLAND

C—Swift & Co.—Plant Food Div.
 P. O. Box 38; tel: TWinoaks 5536. (Main ofc: Chicago, Ill.) R. W. Finch, Mgr.

ONTARIO

C—Pacific Supply Cooperative—Chemical Div.
 P. O. Box 180. (Main ofc: Portland, Oreg.) Oris D. Dearborn, Plant Mgr. 1,500 tons.

CPbm—Valley Wholesale & Warehouse Co.

149 S. E. 1st St.; P. O. Box 659; tel: 470-R. Ed Oakes, Pres.; D. W. Powers, Sec.-Treas. & Pur. Agt.; William M. Murphy, Plant Mgr. 6,000 t. cap.; 1,000 t. stor. 1 mill, 1-ton batch (30 t./day); 2 hopper systems; 2 elevators; 2 lift trucks.

PORTLAND

CDPfi*—Fortified Farm Products Co.

1835 S.W. Jefferson St. Don Parker, Pres. & Mgr. Pesticide Div.; Robt. P. Winchester, Plant Mgr. 10,000 tons.

CO—Jamison Fertilizer Service

7941 S.E. Johnson Creek Blvd. (6); tel: PR 1-7705. Charles Jamison, Owner & Mgr.; Ellamae Jamison, Sec. & Bkpr.; Rodney L. Jamison, Plant Mgr. 1,200 t. cap.; 1,000 t. stor. 2 mills, grinder 4 t./hr., mixer 1 t./8min.; 2 hoppers; tractor shovel; scoopmobile. Bulk output is organics, but mix 5-3-3 & 5-10-5.

CPi—Miller Products Co.

Foot S.W. Caruthers; tel: Capital 8-7608. Roy E. Miller, Pres. & Gen. Mgr.; G. G. Jarrett, Treas. & Pur. Agt.; A. Bjornson, Sec.; Frank B. Stewart, Asst. Gen. Mgr. & Plant Mgr. Blending mills, 4 t./hr.; Sturdevant type ribbon blenders; pulverizing mills 2-10 t./hr.; screw & belt conveyors.

CaP—Oregon-Washington Fertilizer Co.

2011 N.W. York St.; tel: CAPITOL 7202. (Main ofc: Seattle, Wash.) William R. Chorlton, Mgr.; Frank Hayes, Supt. 10,000 t. cap.; 5,000 t. stor. Hopper system; shuttle conveyors; power tractors; trucks.

CDFHPfm—Pacific Supply Cooperative—Chemical Div.

1928 N.W. Vaughn St.; P. O. Box 3819; tel: BRoadway 6621. Karl Baur, Div. Mgr.; George Kitzmiller, Sales Mgr.; R. W. Duncan, Pur. Agt.; L. R. Lusk, Supt. 10,000 t. cap.; 3,000 t. stor. 1 mill; mixer; conveyor; elevator; weigh scales. Plants also at: Madras & Ontario, Oreg.; Quincy, Wash.

C—Webfoot Fertilizer Co., Inc.

202 S.E. Stark St.; tel: BELmont 2-5189. F. E. Peterson, Pres.; Maude Peterson, V.P.; Alec Runciman, Sec.-Treas. 5,000 tons.

CPm—Wilbur-Ellis Co.

1600 N.W. 16th Ave.; tel: CAPITOL 7-2661. (Main ofc: San Francisco, Calif.; Fert. Div. Hdq. Los Angeles, Calif.) Edward L. Asbill, Mgr. 3,500 t. cap.; 600 t. stor. 1 mill.

REDMOND

CPm—Midstate Fertilizer Co.
 Drawer 401; tel: 78. Fred Hodecker & Willetta Hodecker, Ptnrs.; J. Mike Locey, Plant Mgr. 10,000 t. cap.; 1,000 t. stor. 1 mill, 3 tons.

SALEM

CaPbm—Meeker-Hughes, Co., Inc.
 520 Trade St.; P. O. Box 527; tel: 3-7822. P. E. Meeker, Pres.; J. Ross Hughes, V.P.; Frank R. Meeker, Sec.-Treas. & Gen. Mgr.; Rae E.

Blackman, Plant Mgr. 10,000 t. cap.; 4,000 t. stor. 1 mill; Hough Payloader; 2 Clark lifts; bin conveyors, etc.

WARRENTON

OCL—Bioproducts, Oregon, Ltd.

Tel: 2041. R. T. Carruthers, Jr., Sales Mgr. 250 t. cap.; 150 t. stor. 2 mills; steam-jacketed dryers; ladder conveyors; screw conveyors; centrifuges; lift truck.

WOODBURN

CLHPm—Woodburn Feed & Supply Co.

868 N. Front St.; tel: 3521. F. W. Burlingham, Pres.; L. H. Hildebrandt, Sec.-Treas. & Supt.; D. J. Burlingham, Mgr. Liq. Fert.; Harold Yoder, Mgr. Pesticide Div. 3,000 t. cap.; 1,000 t. stor. 1 mill, 20 tons per shift; bucket elevators; hopper.

PENNSYLVANIA

ALLENTOWN

C—Robert B. Peters Co.

739 N. 7th St.; tel: HEMlock 2-8193. Roberts B. Peters, Owner; James E. Peters, Plant Mgr. 2,500 t. cap.; 50 t. stor. 1 mill, ¼ ton.

CagFPb—Robert A. Reichard, Inc.

19th & W. Lawrence Sts.; tel: HEMlock 4-7107. Clarence A. Reichard, Pres.; Howard E. Reichard, V.P.; Eugene A. Reichard, Treas. & Plant Mgr.; Herbert E. Krock, Sec. 20,000 t. cap.; 7,000 t. stor. 1 mill, 20 t./hr.; hopper system; conveyors; Hough Payloaders; valve packer; pelleting equipment.

AMBLER

SC—American Chemical Paint Co.
 Leon Cherksey, Pres.; G. C. Romig, V.P.; W. Graham Smith, Plant Mgr.; E. A. Snyder, Pur. Agt.; Joseph H. Torchiana, Ag. Chem. Div. Soluble plant food for home garden trade only.

BUTLER

CaFP—Central Chemical Corp.

(Main ofc: Hagerstown, Md.) W. L. Murrin, Plant Mgr. 15,000 t. cap.; 7,500 t. stor. conveyors; shovels; hopper system.

CARLISLE

E—ADCO Works

333 W. High St.; tel: 371. Dr. F. M. Lawrence, Dir. 1,500 t. cap.; 2,000 t. stor. 1 mill, 5 t./day; mixer; scales; packaging machine.

CF—Carlisle Fertilizer Works, Inc.

Ofc: N. West St.; tel: 63-W. P. O. Sunday, Pres. & Pur. Agt.; Richard Roop, Sec.; Robert Heckaan, Treas.; Roy Warner, Plant Mgr. 2,000 t. cap.; 1,000 t. stor.

COATESVILLE

CFP—Koller Fertilizer Co.

(Main ofc: York, Pa.) T. H. Koller, Ptnr. & Pur. Agt. 10,000 tons.

CORNWELLS HEIGHTS

E—Cornwell Chemical Corp.

2583 State Rd.; tel: 0700. (Main ofc: New York, N. Y.) A. A. Arndt, Plant Mgr. (Sulfuric acid plant.)

DU BOIS

CagPi—Swack Fertilizer Co.

P. O. Box 26; tel: 1260, 1261. John

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
S—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

T. Swack, Sr., Pres. & Pur. Agt.; Robert A. Swack, V.P., Treas., Prod. Mgr. & Mgr. Pesticides Div.; M. E. Hubbs, Sec.; Paul A. Snedden, Supt. 10,000 t. cap.; 5,000 t. stor. 1 mixer, 2 ton; 4 belt conveyors; 2 bagging units; crusher; 3 Hough Payloaders; car spotter; 3 bucket elevators; complete pesticide formulating unit.

ELIZABETHTOWN

CF—Farmers' Fertilizer Works

365 Bainbridge St.; tel: 7-1211. J. H. Buch, Pres.; J. K. Garman, V.P.; W. G. Hawthorne, Treas. & Gen. Mgr.; J. W. Staman, Sec.; W. B. Schneitman, Asst. Sec. 8,000 t. cap.; 4,000 t. stor. 2 mills; complete conveyor system from mixer to bins; 2 tractor shovels; St. Regis large bag packer; Union Special open-mouth packer.

EPHRATA

C—Lancaster Bone Fertilizer Co.

(Main ofc: Quarryville, Pa.) 20,000 tons.

ERIE

CPm—Erie Reduction Co.

Foot of East Ave.; tel: 2-3528. P. J. Shields, Pres., Treas. & Gen. Mgr.; D. E. Shields, V.P. & Sec. 4,000 t. 1 mill, ½ ton; bucket elevator; screen; mill; conveyor; shovels.

EVERETT

CaFpm—Central Chemical Corp.

9th St.; P. O. Box 68; tel: 99. (Main ofc: Hagerstown, Md.) Geo. Cassel, Plant Mgr. 10,000 t. cap.; 3,500 t. stor. 2 mills; tractor shovels.

GETTYSBURG

CaFpm—General Chemical Corp.

Tel: 514. (Main ofc: Hagerstown, Md.) Donald R. White, Plant Mgr. 10,000 t. cap.; 3,500 t. stor. 1 mill; rotary mixer; 3 tractor shovels.

GLEN ROCK

CFL—Koller Fertilizer Co., Inc.

P. O. Box 266; tel: 30, 10. (Main ofc: York, Pa.) J. Franklin McCleary, Plant Mgr. 10,000 t. cap.; 1,200 t. stor. 2 mills (1 cage & 1 swing hammer), 50 t./day; elevators; conveyors; tractor shovels.

HANOVER

CLP—Miller Chemical & Fertilizer Corp.

Tel: 3-0197. (Main ofc: Baltimore, Md.) A. G. Fischer, Plant Mgr. 15,000 tons. Belt conveyors; hopper system.

CaDFLHPbm—Union Fertilizer Corp.

Ofc: 222 Clearview Rd.; plant: R.F.D. 3; P. O. Box 311; tel: 2-7181. A. S. Sergeant, Pres.; J. Miller, V.P.; Howard F. Long, Sec.-Treas.; A. Fisher, Supt. 8-10,000 t. cap.; 4,000 t. stor. 2 mills, 5 tons.

KINGSTON

LPf—The DeWitt Chemical Co.

303 Market St. H. C. Jeter, Pres.; F. E. Parkhurst, III, Treas.; A. D. Smith, V.P. & Asst. Treas.; J. L. McDonald, Sec. Formulate liq. fert. & pesticides from basic materials.

KITTANNING

Cag—Eastern States Farmers' Exchange, Inc.

P. O. Box 287; tel: 42-3101. (Main ofc: W. Springfield, Mass.) J. R.

Myers (York, Pa.) Mgr. Fert. Prod.; Curtis H. Kelso, Plant Mgr. 25,000 t. cap.; 12,000 t. stor. 1 mixing unit, 20 t./hr. 2 shipping units, 30 t./hr. ea.; belt conveyors for bulk & bagged goods; trucks; tractors; power shovels for digging & loading; hopper system for batching; granulation unit; TVA ammoniator, cooler & dryer.

LANCASTER

CFPfm—Organic Plant Food Co.

Groftown Rd.; P. O. Box 132; tel: 2-4963. Norman B. Brubaker, Pres., Supt. & Pur. Agt.; Mary M. Brubaker, Sec.-Treas.; J. Robert Leiblev, Asst. Sec.-Treas. 2,500 t. cap.; 1,200 t. stor. Hopper; blender; conveyor; 2 bucket elevators; Ford tractor with shovel attachment; Hough Pavloader; dump truck; flat truck; light pickup delivery truck.

LEBANON

CaGLPf—Lebanon Chemical Corp.

Tel: 3-1687. Vernon Bishop, Pres.; Arthur M. Mohler, Mgr.

CFPm—Olin Mathieson Chemical Corp.—Eastern Fertilizer Div.

25-27 Hoffman St.; P. O. Box 214. (Div. ofc: Baltimore, Md.) A. B. Verderv (Baltimore) Northeast Dist. Mgr.; M. J. Kleisner, Ofc. Mgr.

McKEESPORT

CPfm—The Summers Fertilizer Co., Inc.—KAPCO Div.

603 Walnut St.; P. O. Box 20; tel: ORchard 2-0337. (Main ofc: Baltimore, Md.) Philip P. Rosette, Mgr.; H. J. Miller, Asst. Mgr.; James A. Wargo, Plant Supt. 4,000 t. cap.; 2,000 t. stor. 1 mill, 20 t./hr.; conveyors; tractor shovels.

MILTON

CaFpm—Central Chemical Corp.

303 Railroad Ave.; tel: 344. (Main ofc: Hagerstown, Md.) Chester G. James, Plant Mgr. 20,000 t. cap.; 7,500 t. stor. 2 mills.

OXFORD

C—Lancaster Bone Fertilizer Co.

(Main ofc: Quarryville, Pa.)

PARADISE

CFPm—Amos Eby & Co.

S. Clayton Ranck, Ptnr.; Robert E. Ranck, Ptnr.; Milton Hershey, Plant Mgr. 10,000 tons.

PHILADELPHIA

Ba—Baugh & Sons Co.

Office: 20 S. Delaware Ave. (6); Plant: 1701 S. Delaware Ave.; tel: LO 3-2140. (Main ofc: Baltimore, Md.) N. C. Harrington, Div. Sales Mgr.; C. S. Clarkson, Plant Supt.

CaFH—Independent Manufacturing Co.

Wheatshaf Lane & Aramingo Ave. (37); tel: JE 5-8500. H. J. Smith, Ptnr. & Pur. Agt.; Robert E. Smith, Ptnr.; Thacher G. Foss, Plant Mgr. 30,000 t. cap.; 13,000 t. stor. 2 mills, 30 t./hr.; continuous mixing; overhead belt loading bins; 2 valve packers; Kraft O.M. Packer and Inglett & Corley packer; 4 Wagner scoops; 6 HA Payloaders; conveyor from packers to cars & trucks.

C—M. L. Shoemaker Co.—Div. Wilson & Co.

Delaware Ave. & Venango St.

(Main ofc: Chicago, Ill.) R. O. Fisher, Supt. 8,000 tons.

I. P. Thomas Div.—Pennsylvania Salt Mfg. Co.

3 Penn Center Plaza (2); tel: LOcust 4-4700. R. R. Hull, Gen. Mgr. Plant at Paulsboro, N. J.

CF—F. W. Tunnell & Co., Inc.

15 N. 5th St. F. H. Tunnell, Pres.; B. A. Tunnell, V.P.; Ira C. Young, Treas.; D. S. Tunnell, Sec.; E. N. Angus, Plant Mgr.; A. E. Horner, Prod. Mgr.; R. E. Deal, Pur. Agt. 40,000 tons.

PITTSBURGH

United States Steel Corp.

General offices: 525 William Penn Pl. (30). Coal Chemical Sales Div. C. W. Baldwin, Gen. Mgr.; J. W. Clinton, Asst. Gen. Mgr.; W. E. Nordquist, Product Mgr., ammonium sulphate. Ammonium sulphate producing plants at: Fairfield, Ala.; Joliet, Ill.; Gary, Ind.; Duluth, Minn.; Cleveland, & Lorain, Ohio; Clairton & Fairless, Pa.; Geneva & Ironton, Utah.

QUARRYVILLE

CaF—Lancaster Bone & Fertilizer Co., Inc.

Tel: 101. H. W. Huffnagle, Pres. & Pur. Agt.; M. B. Huffnagle, V.P.; S. E. Glisson, Sec.-Treas.; John Hoffmann, Plant Mgr. Conveyors; tractor shovels. Combined production of 3 plants 12,000 tons. Plants also at Ephrata & Oxford, Pa.

READING

CFHPm—Reading Bone Fertilizer Co.

P. O. Box 232; tel: 4-1602. A. A. Schultz, Pres. & Pur. Agt.; W. A. Schultz, V.P. & Plant Mgr.; Allen Willits, Sec.-Treas. 15,000 t. cap.; 5,000 t. stor. 1 mill.

SHIPPENSBURG

CFPb—Cumberland Valley Cooperative Assn.

W. Orange St.; P. O. Box K; tel: 51. Walter C. Nickles, Treas.; Floyd M. Mains, Pur. Agt. 4,000 t. cap.; 1,000 t. stor. 1 mill; 1 conveyor belt; 1 tractor scoop.

SOMERSET

CFI—A. D. Graham & Co., Inc.

Stoystown Rd.; P. O. Box 310; tel: 6565. A. D. Graham, Pres. & Mgr.; M. Elizabeth Graham, Sec.-Treas. 10,000 t. cap.; 6,000 t. stor. 1 mill, 15 t./hr.; mixer; bagger, 35 t./hr.; Payloaders; complete conveyor system for both bulk & bagged goods.

UNION CITY

CaFP—Coop. G.L.F. Soil Building Service

Tel: 500. (Main ofc: Utica, N. Y.) James H. Starr, Plant Mgr. 20,000 t. cap.; 8,000 t. stor. 2 mills, 35 t./hr.; complete hopper & conveyor sys-

YORK

Cag—Eastern States Farmers' Exchange, Inc.

Fertilizer Production Div. Headquarters, Luicks Mill Rd.; P. O. Box 29; tel: 8-2004. (Main ofc: West Springfield, Mass.) J. Raymond Myers, Mgr. Fert. Prod. Div. & Pur. Agt.; C. F. Grimm, Plant Mgr. 35,000 t. cap.; 18,000 t. stor. 1 mixing unit, 25 t./hr.; 2 shipping units, 30 t./hr. ea.; belt conveyors; trucks &

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
a—ammoniate g—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

tractors; power shovels for digging & loading; hopper systems for batching; mixing dryer, cooler for granulation; bulk loading for trucks. Plants also at: Wilmington, Del.; N. Cambridge, Mass., & Kittinging, Pa.

Koller Fertilizer Co., Inc.
Main Office: Centre Sq., Room 50, Hartman Bldg.; tel: 3-5440. Plants at Coatesville & Glen Rock, Pa. Totals for both plants: 10,000 t. cap.; 2,000 t. stor.; 2 mills, 100 t./day each; 3 power shovels.

CaF—York Stone & Supply Co.
Roosevelt Ave. Extd.; P. O. Box 1564; tel: 7357. George L. Cramer, Pres. & Pur. Agt.; Frederick W. Cramer, Jr., V.P.; Amos Raffensberger, Sec.-Treas.; Raymond S. Ott, Plant Mgr. 25,000 t. cap.; 10,000 t. stor. 1 mill 1½ ton; Sturtevant hopper & mixer; 5 Link-Belt & 2 Farquhar conveyors; 2 St. Regis valve packers; Hough Payloader.

RHODE ISLAND

EAST PROVIDENCE

CaF—Fox Point Chemical Co.
49 Valley St.; tel: EA 1-3684. L. M. Weyker, Pres.; A. J. LaPrise, V.P.; T. J. Whelan, Treas. & Supt. 20,000 t. cap.; 10,000 t. stor. 3 mills, 30 t./hr.; overhead conveying system; tractor shovels.

SOUTH CAROLINA

AIKEN

C—Aiken Fertilizer Co.
P. O. Box 504. Mrs. Rosa F. Prothro, Owner; W. D. Gregorie, Jr., Mgr.; D. B. Arthur, Plant Mgr.; J. D. Prothro, Pur. Agt. 2,000 tons.

ALLENDALE

CP—Allendale Fertilizer Co.
Tel: 2501. J. V. Spigener, Sr., Pres.; J. V. Spigener, III, V.P.; J. V. Spigener, Jr., Mgr. 1 mill, 1,200 t.; hopper system.

ANDERSON

AF—Anderson Fertilizer Co., Inc.
102½ N. McDuffie St.; P. O. Box 136; tel: Canal 4-3501. George W. Gage, Pres. & Gen. Mgr.; A. B. Jackson, V.P.; W. H. Farmer, Treas.; B. D. Smith, Sec.; E. U. Campbell, Plant Engr. 30,000 tons. 1 mill; automatic hopper equipped with overhead belt; overhead crane; automatic weighing machine.

C—McLees Fertilizer Co.
500 S. Murray; tel: Canal 5-5621. F. C. McLees, Pres., Treas. & Mgr.; Katherine H. McLees, V.P. & Sec. 5,000 tons. 1 mill; 1 belt conveyor.

ANGELUS

CDP—J. M. Jordan
J. M. Jordan, Owner & Mgr. 6-800 tons. 1 mill.

BATESBURG

Ca—Batesburg Fertilizer Co.
Drawer 70; tel: 6984. A. C. Jones, Pres. & Treas.; Ethel Jones Rice, V.P.; Josephine Jones Stoddard, V.P.; Wm. Cook, Sec.; A. C. Jones, Plant Mgr.; Virgil Taylor, Supt. 10,000 t. cap.; 2,000 t. stor. 1 mill; hopper system.

BLACKVILLE

CaF—Brown Fertilizer Co., Inc.
Tel: 2121 & 2131. D. Stanley Brown, Pres.; Herman Brown, Sec.-Treas.; Fletcher Turner, Supt. 8,500 t. cap.; 5,000 t. stor. 1 mill; 3 Payloaders; 2 conveyors.

CHARLESTON

A—The American Agricultural Chemical Co.
P. O. Box 834; tel: Charleston 3-2726. (Main ofc: New York, N. Y.) E. L. Ready, Jr., Mgr.; W. R. Bryant, Supt.

AaPfm—Davison Chemical Co.—Div. W. R. Grace & Co.
Harmon & Elgin Sts.; P. O. Box 858; tel: 2-3321. (Main ofc: Baltimore, Md.) J. F. Stough, Dist. Mgr.; U. S. Aaron, Mgr.

Ca—Etiwan Fertilizer Co.
P. O. Box 537; tel: 2-2878, 2-4616. W. R. Sullivan, Pres.; James G. Gibbs, V.P.; H. S. Means, Sec.; Elias Ball, Treas.; J. H. Kelly, Supt. 25,000 tons. 2 mills, 240 tons per day; hopper system; belt conveyors throughout.

C—Logan-Robinson Fertilizer Co.
502 Peoples Bldg.; tel: 2-2031. W. Hampton Logan, Sr., Pres.; W. Hampton Logan, Jr., V.P.; W. Allan Moore, Jr., Treas.; J. C. McManus, Sec.; E. W. Weekly, Supt. 25,000 t. cap. 2 mills; Payloaders; tractors; conveyors.

C—Maybank Fertilizer Corp.
5 Exchange St.; P. O. Box 847; tel: 2-2871. David Maybank, Pres.; John E. F. Maybank, V.P.; Augustus T. Curtis, Gen. Mgr. & Treas.; S. Mortimer Clement, Sec.; Wm. R. Webb, Supt. 35,000 tons.

CaPfm—Molony Fertilizer Co.
P. O. Box 314; tel: 4-5356. John C. Molony, Pres.; John H. Schachte, V.P. 25,000 t. cap.; 6,000 t. stor. 2 mills, 1 & 2 tons; hopper system; belt conveyors; Payloaders.

AaGDFLHPfm—Planters Fertilizer & Phosphate Co.
King St. Ext.; Box 865; tel: 3-7267. J. Ross Hanahan, Pres.; J. R. Hanahan, Jr., Treas.; W. O. Hanahan, V.P. & Gen. Mgr.; Walter B. Meets, Treas.; J. S. Hanahan, Sec.; A. C. Palmer, Supt. 100,000 t. cap.; 40,000 t. stor. 3 mills; hoppers; conveyors; Hough loaders; mixers; pumps; Glen Falls burners. Plants also at Charlotte, N. C. & Sumter, S. C.

A—A. F. Pringle & Co., Inc.
141 E. Bay St.; P. O. Box 904; tel: 2-8366 & LD909. Ashmead F. Pringle, Jr., Pres.; L. L. Oliveros, V.P., Treas. & Pur. Agt.; C. L. Paul, Sec. & Prod. Mgr.; J. H. Wragge, Supt. & Plant Mgr. 125,000 t. cap.; 35,000 t. stor. 2 mills, 10 t./hr ea.; 14 Inglett & Corley mixers; 19 Hough Payloaders; 4 Sturtevant mixing & shipping units. Discontinuing fertilizer production December 1, 1955, but continuing in business as distributors.

A—F. S. Royster Guano Co.
P. O. Box 167. (Main ofc: Norfolk, Va.) P. L. Steele, Supt.

A—Virginia-Carolina Chemical Corp.
Tel: 4-6227 & 4-6228. (Main ofc: Richmond, Va.)

CHERAW

C—Burr Gin & Fertilizer Co.

P. O. Box 227; tel: 5341. John A. Burr, Owner; Robert C. Burr, Plant Mgr. & Mgr. Pesticides Div. 1 mill, 3,000 t. cap.

CHESTER

CaF—Victor Fertilizer Co.
York Rd.; P. O. Box 324; tel: 3117 & LD 3118. R. A. Oliphant, Mgr. & Pur. Agt.; J. W. Bond, Jr., Supt. 21,000 t. cap.; 14,000 t. stor. 2 mills; Payloaders; hoppers; conveyors.

COLUMBIA

A—The American Agricultural Chemical Co.
P. O. Drawer 69; tel: (sales) 4-3167, (works) 8040. (Main ofc: New York, N. Y.) R. G. Lytch, Mgr.; G. E. Richardson, Supt.

C—Armour Fertilizer Works
Broad River Rd.; P. O. Box 231; tel: 4-5657. (Main ofc: Atlanta, Ga.) P. J. Zeigler, Div. Mgr.

The Southern Cotton Oil Co.
Green & Gadsden Sts.; P. O. Box 840; tel: 2-1903. (Main ofc: New Orleans, La.) C. Fitz Simmons, Jr., Dist. Mgr. for plants at: Davidson, Gibson, & Shelby, N. C.; Florence, Laurens, & Spartanburg, S. C.

C—Swift & Co.—Plant Food Div.
Box 5285, Five Points Branch; tel: 4-3924, 3-7191. (Main ofc: Chicago, Ill.) E. H. Rappe, Mgr.

DENMARK

C—Denmark Fertilizer Co.
J. B. Guess, Jr., Pres. & Pur. Agt.; J. W. Williamson (Norway, S. C.), Ptnr.; T. Conner Guess, Plant Mgr. 2,000 tons.

FAIRFAX

C—Carolina Mixing Co.
A. M. Marshall, Owner. 2,000 tons.

FLORENCE

CF—The Southern Cotton Oil Co.
Tel: 2224. (Main ofc: New Orleans, La.; Dist. ofc: Columbia, S. C.) W. B. Nickles, Mgr.

FOUNTAIN INN

CaP—Smith & Brooks, Inc.
Box 341; tel: 3371. Walter H. Smith, Pres., Treas. & Plant Mgr.; J. T. Brooks, Jr., V.P.; H. C. Brooks, Sec. 1,400 t. cap.; 900 t. stor. Belt & bucket conveyors.

GAFFNEY

CPB—Keys Sanders Fertilizer Co.
901 Beach St.; P. O. Box 539; tel: 6364. Mrs. Margaret T. Sanders, Pres. & Treas.; Mrs. Eleanor S. Day, V. P. & Sec.; C. F. Blackwell, Plant Mgr. 7,000 t. cap.; 2,500 t. stor. 1 mill.

GRAMLING

CF—Gramling Merco Co., Inc.
Henry Gramling, Pres. & Pur. Agt.; A. F. Pringle, V.P.; L. L. Oliveros, Sec.-Treas.; Boyd Harmon, Asst. Treas. & Prod. Mgr.; Cecil Harris, Plant Mgr. 6,000 tons. 1 mill; belt conveyors; Payloaders.

GREELEYVILLE

Cg—Santee Guano Co.
L. G. Mishoe, Owner & Operator; J. R. Mishoe, Supt. 4,000 t. cap.; 1,000 t. stor. 1 mill, 4,000 t. cap.; hoppers.

GREENVILLE

CPB—Independent Guano Corp.
213 E. Court St.; tel: 2-8961. S.

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
S—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

Avery Smith, Pres. & Treas.; W. J. Long, Supt. 2,000 t. cap.; 10,000 t. stor. 1 mill; 1 cone mixer.

A—Virginia-Carolina Chemical Corp.
Tel: 3-7453. (Main ofc: Richmond, Va.)

GREENWOOD

CaF—Piedmont Fertilizer Corp.
S. Main St.; P. O. Box 66; tel: 8-3666. C. Y. Thomason, Pres.; W. N. Henderson, Jr., Plant Mgr. 3,000 tons. 1 mill, 1 ton.

GREER

Ca—Dobson Guano Co.
Tel: 175-W. L. M. Dobson, Mgr. 2,500 t. cap.; 1,000 t. stor. 1 mill; 1 Payloader.

CPb—Greer Guano Co.
104 S. Line St.; tel: 128. E. D. Tillotson, Ptnr., Plant Mgr. & Pur. Agt.; A. B. Coggins, Ptnr. & Prod. Mgr. 3,000 t. cap.; 1,000 t. stor. Dry mixer; buggies & shovels.

HARTSVILLE

Ba—International Minerals & Chemical Corp.
P. O. Box 389; tel: (ofc.) 600, (plant) 137. (Main ofc: Chicago, Ill.) F. W. Atkinson, Area Mgr.; J. C. Calhoun, Dist. Sales Mgr.; P. L. Webb, Supt.

HEMMINGWAY

C—Coastal Fertilizer Co.
Tel: 3693. R. L. Cox, Owner; P. B. Ard, Supt. 2,000 t. cap.; 1,000 t. stor. 1 mill; conveyor.

HOLLY HILL

CaHPm—Holly Hill Fertilizer Co.
Railroad Ave.; tel: 17. E. A. Crout, Pres.; J. M. Russell, V.P.; D. M. Avinger, Sec.-Treas. & Mgr.; W. C. Martin, Supt. 15,000 t. cap.; 7,000 t. stor. 1 mill, 40 t./hr.; 3 Payloaders.

JEFFERSON

CP—Miller Fertilizer Co.
Tel: 10, 17. J. C. Miller, Owner; Joe F. Miller, Mgr. 4,000 t. cap.; 1,000 t. stor. 1 mill, ½ ton.

JOHNSTON

CaFPm—Ridge Fertilizer Co.
Tel: 2507. W. C. Cassels, Pres. & Pur. Agt.; D. G. Cassels, V.P.; Melvin Stokes, Plant Mgr. 10,000 t. cap.; 4,000 t. stor. 2 mills, 5,000 t./yr. ea.; conveyors; tractor shovels.

KERSHAW

C—Kershaw Oil Mill
Tel: 2335, 3575. H. L. McPherson, Pres. & Gen. Mgr.; Fred E. Culvern, V.P.; T. V. Hough, Treas. & Asst. Gen. Mgr. 10,000 t. cap.; 5,000 t. stor. 1 mill, 30 t./hr.; hopper system; conveyors; tractor shovels. Plant also at Marion, S. C.

LAKE CITY

Singletary Fertilizer Co.
113 N. Boulevard; tel: 5201. W. Wesley Singletary, Pres.; Mrs. Mary S. Driggers, V.P.; Wesley J. Singletary, Sec.; Paul S. Singletary, Treas.; K. E. Hill, Jr., Supt. 5,000 t. cap.; 3,000 t. stor. 1 mill, ½ ton; Payloader.

LANCASTER

BF—Catawba Fertilizer Co.
P. O. Box 350; tel: 4181. W. G. Taylor, Pres. & Prod. Mgr.; Mrs. Edna S. Stevens, V.P.; A. R. Carhill, Treas.; J. W. Medford, Sec.; E. C. Beckham, Plant Supt. 25,000 t.

cap.; 18,000 t. stor. 1 mill, 300 t./day; hopper systems; conveyors; tractor shovels.

LATTA

CFPm—D. M. Dew & Sons, Inc.
Tel: 2841. D. M. Dew, Jr., Pres. & Treas.; Leslie Whittington, Plant Mgr. 3,000 t. cap.; 2,000 t. stor.

CP—Manning & Shine

Tel: 4861. L. A. Manning, Jr., Ptnr. & Pur. Agt.; D. B. Shine, Ptnr.; L. R. Bethea, Plant Mgr. 2,000 t. cap.; 700 t. stor. 1 mill, 10 t./hr.

LAURENS

CF—The Southern Cotton Oil Co.
P. O. Box 258; tel: 502. (Main ofc: New Orleans, La.; dist. ofc: Columbia, S. C.) L. H. Taylor, Mgr.

LEESVILLE

CaPm—Epting Distributing Co.
Tel: Kellogg 2-4565. J. H. Epting, Owner; J. N. Davis, Mgr. & Pur. Agt. 5,000 t. cap.; 1,000 t. stor. 1 mill, 10 t./hr.; Payloader; conveyor; car loader.

LYNCHBURG

CP—Lynchburg Fertilizer Co.
P. O. Box 66; tel: 3311. C. A. Vincent, Pres.; Howard F. Vincent, Gen. Mgr.; R. G. Vassy, Mgr. Pesticide Div. 2,000 t. cap.; 600 t. stor. 1 mill, ¼ ton.

MARION

CP—Marion Cotton Oil Co.
P. O. Drawer 900; tel: 104. (Subsidiary of Kershaw Oil Mill, Kershaw, S. C.) Wilson W. Snipes, Mgr.; Roy Peebles, Supt. 3,000 t. cap.; 1,000 t. stor. 1 mill, 1 ton.

MULLINS

CaFHPm—Home Guano Co.—Div. John Cooper Stores, Inc.
Tel: 2916. John P. Cooper, Pres.; Franklin B. Cooper, V.P.; N. Bryant Cooper, Sec.-Treas.; Frank Johnson, Plant Mgr. 10,000 t. cap.; 3,000 t. stor. ½-ton Atlanta Utility fertilizer mill; 300-lb. Young insecticide mixer; overhead conveyors for all materials; self-built hopper system; 2 Payloaders.

MYERS

Ca—Southern Fertilizer & Chemical Co.
P. O. Box 6384 (Charleston); tel: (Charleston) 4-6276. (Main ofc: Savannah, Ga.) Ashley L. Brogdon, Plant Mgr. 15-20,000 t. cap.; 10,000 t. stor. 2 mills, 40 t./hr.; conveyors; tractors; shovels.

NORTH

C—J. E. Culler Fertilizer Co.
Tel: 7802. J. E. Culler, Owner; Warren Hutto, Plant Mgr. 4,000 tons. 1 mill, 100 tons per 10 hrs.

PAMPLICO

CPb—Coleman Guano Co.
Buster Coleman, Mgr.; M. C. Coleman, Gen. Mgr. & Mgr. Pesticide Div. 4,000 tons.

C—Pamplico Fertilizer Co., Inc.

J. E. Bostick, Pres.; Robert W. Coleman, V.P.; G. D. Cox, Sec.-Treas. & Plant Mgr. 5-6,000 tons.

PENDLETON

CaFHPbm—Pendleton Oil Mill, Inc.

Tel: 4401. E. N. Sitton, Pres. & Treas.; A. J. Sitton, V.P. & Sec.; Robert W. Parker, Supt. 10,000 t. cap.; 3,500 t. stor. 1 mill, 30 t./hr.; Inglett & Corley hopper system to mixer to belt conveyor to storage; tractor shovels; Schachte bagging machine.

RIDGEWAY

CF—Chas. P. Wray & Co.
Tel: 55. J. S. Edmunds, Owner & Pur. Agt.; J. P. Hollis, Plant Mgr. 2,000 t. cap.; 1,000 t. stor. 1 mixer, 1 ton batch; 2 Payloaders.

ROEBUCK

Ca—Southern Fertilizer & Chemical Co.
Tel: (Spartanburg) 3-8623. (Main ofc: Savannah, Ga.) J. P. Huckaby, Plant Mgr. 7,500 to 10,000 t. cap.; 4,500 t. stor. 1 mill, 1 ton; Payloaders.

ST. GEORGE

CPm—Dorchester Cotton Oil Co.
Tel: 3042. W. T. Brown, Pres. & Treas.; A. R. Brown, V.P. & Sec. 4,000 t. cap.; 1,000 t. stor. Tractor shovels.

ST. MATTHEWS

CaFHPbm—Banks Fertilizer Co.
Tel: 5411. D. H. Banks, Sr., (Plant Mgr. & Pur. Agt.) R. W. Banks (Prod. Mgr.); J. A. Banks, & D. H. Banks, Jr., Ptnrs. 3,500 t. cap.; 1,200 t. stor. 1 mill, 15 t./hr.; 2 Hough Payloaders.

C—Eastover Fertilizer Co.

A. S. Smoke, Pres. & Sec.; W. G. Smoke, Treas. 3,500 tons.

SALLEY

CPb—Salley Gin & Fertilizer Co.
Tel: 811. L. A. McMillan, Mgr. & Pur. Agt. 1,500 tons. 1 mill.

SENECA

C—W. P. Nimmons & Co.
Tel: 614. W. P. Nimmons, Mgr. 2-3,000 tons.

SPARTANBURG

C—The American Agricultural Chemical Co.
P. O. Box 890; tel: 7767. (Main ofc: New York, N. Y.) Jack Rogers, Mgr.; J. E. Martin, Supt.

CP—Caldwell's, Inc.

Sibley Ave.; P. O. Box 100; tel: 2-1251. Jas. B. Caldwell, Jr., Pres.; Ralph M. Caldwell, Sec.-Treas.; F. L. Lassiter, Supt. 2,500 t. cap.; 1,500 t. stor. 1 mill; belt conveyors; power shovels.

CaPm—Davison Chemical Co.—Div. W. R. Grace & Co.

P. O. Box 1128; tel: 3-8550. (Main ofc: Joplin, Mo.) U. S. Aaron (Charleston, S. C.) Mgr.; John P. Sellers, Supt.

A—International Minerals & Chemical Corp.

P. O. Box 173; tel: 6759. (Main ofc: Chicago, Ill.) A. L. Foster, Supt.

C—F. S. Royster Guano Co.

Hayne, S. C.; P. O. Box 565 (Spartanburg, S. C.); (Main ofc: Norfolk, Va.) E. H. Wood, Supt.

CF—The Southern Cotton Oil Co.

325 W. Henry; P. O. Box 252; tel: 7251, 7252. (Main ofc: New Orleans, La.; dist. ofc: Columbia, S. C.) H. B. Lipscomb, Mgr.

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
a—ammoniate g—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

SUMTER

CaPm—W. B. Boyle Co.

Ofc: 30 E. Liberty St.; Plant 310 E. Liberty St.; P. O. Box 471; tel: SPruce 3-9337. Edwin B. Boyle, Pres.; William B. Boyle, V.P. & Treas.; S. Marvin Brown, V.P. & Gen. Mgr.; S. G. Brading, Sec. 4,000 t. cap.; 3,000 t. stor. 1 mill; 2 Payloaders; car slinger; sewing machine; conveyor.

C—Sumter Fertilizer Manufacturing Co., Inc.

P. O. Box 1086; tel: SPruce 3-9364. (Subsidiary of Planters Fertilizer & Phosphate Co., Charleston, S. C.) J. A. McKnight, Pres.; W. O. Hanahan, V.P.; J. Ross Hanahan, Treas.; J. S. Hanahan, Sec.; H. N. Wright, Mgr. & Pur. Agt.; Louis Driggers, Supt. 10,000 tons.

TIMMONSVILLE

CaPbm—Anderson Guano Co.

212 Main St.; P. O. Box 398; tel: 5861. Mrs. Mary Q. Hawkins, Owner; F. E. Sansbury, Plant Mgr. 5,000 t. cap.; 1,000 t. stor. 1 mill; tractor shovel; conveyor for basing down in bulk.

UNION

CF—Union Oil Mills

N. Church St.; tel: 13. N. R. Fowler, Pres. & Pur. Agt.; A. G. Kennedy, V.P.; Hettie Kennedy Fowler, Sec. Treas. 2,500 t. cap.; 1,200 t. stor. 2 mills, 1,250 t./yr. ea.; Payloader.

WAGENER

CP—J. A. Tyler & Sons

Tel: 4681. John A. Tyler, Jr., Pres.; A. E. McCord, Mgr. 2,500 tons. 1 mill.

WALHALLA

CDP—J. E. Bauknight, Jr.

Box 145. J. E. Bauknight, Jr., Owner; Robert Dilworth, Plant Mgr. 5,000 tons.

WESTMINSTER

CFP—Westminster Gin & Fertilizer Co.

S. Main St.; P. O. Box 188; tel: 3981. J. E. Marett, Pres.; E. C. Marett, Sec. Treas. & Mgr. 2,000 t. cap.; 800 t. stor. 1 mill.

WILLISTON

CD—Smith Fertilizer Co.

Tel: 4561. Winchester Smith, Pres., Treas. & Pur. Agt.; Norman M. Smith, II, V.P. & Plant Mgr.; Mrs. Carrie M. Bell, Sec. 2,000 tons. 1 mill.

C—Williston Fertilizer Works

Box 335; tel: 4433. Q. A. Kennedy, Jr., Owner; Q. A. Kennedy, III, Mgr. 5,000 tons.

SOUTH DAKOTA

RAPID CITY

CDPb—Tri-State Milling Co.

426 Omaha St.; tel: Filmore 2-6172. Chet Smith, Mgr. Ag. Chem. Div.

SIOUX FALLS

CaPm—The Summers Fertilizer Co., Inc.

P. O. Box 465; tel: 4-5643. (Main ofc: Baltimore, Md.) W. A. Stolt, Mgr.; A. J. Klavervkamp, Asst. Mgr. 40,000 t. cap.; 18,000 t. stor. 2 mills, 40 t./hr.; hopper systems; conveyors; tractor shovels.

TENNESSEE

CHATTANOOGA

B—Chickamauga Fertilizer Works.

(Shipping point: Tyner, Tenn.); P. O. Box 5005, E. Chattanooga. (Main ofc: A. D. Adair & McCarty Bros., Inc., Atlanta, Ga.) J. B. Carlton, Supt. 20,000 t.

CLARKSVILLE

Ca—International Minerals & Chemical Corp.

Hwy. 41-A, North; P. O. Box 69; tel: 3-1519, 3-1510. (Main ofc: Chicago, Ill.) James H. Sibley, Dist. Sales Mgr.; J. H. Whitesides, Supt.

BCF—Tennessee Plant Food Co.—Div. Soil Builders, Inc.

Red River St.; P. O. Box 61. B. C. Milner, Jr., V.P. & Pur. Agt.; H. W. Short, Gen. Mgr., Prod. Mgr. & Pur. Agt.; Robert L. Weakley, Plant Mgr. 20-30,000 tons.

COLUMBIA

E—Armour Fertilizer Works

P. O. Box 113; tel: 1066. (Main ofc: Atlanta, Ga.) Phosphate rock mines. W. B. King, Plant Supt.

E—Ruhm Phosphate & Chemical Co.

Ofc: 813 S. Garden St.; Plant: Mooresville Pike; P. O. Box 361; tel: 3610. Oliver M. Babcock, Jr., Pres. & Gen. Mgr.; Jere A. Dorminy, Asst. to Gen. Mgr.; W. B. Huff, Plant Mgr. 150,000 t. cap.; 4,000 t. stor. 4 mills, 4 t./hr. ea.

E—Shea Chemical Corp.

P. O. Box 602; tel: 3071. (Main ofc: Jeffersonville, Ind.) O. D. Crosby, Supt. Fertilizer grade phosphoric acid & potash-phosphate fertilizer material.

COVINGTON

Ca—Farm Services

East St. at Sherrod Ave.; tel: 2290. W. G. McGowan, Jr., Pres. & Mgr. W. G. McGowan, Sr., V.P.; Mrs. V. A. Roy, Sec. Treas. 10,000 t. cap.; 4,000 t. stor. 1 mill, ½ ton.

DAYTON

BF—Dayton Coal & Iron Corp.

L. A. Morgan, Pres.; J. Wesley Gardner, V.P. & Treas.; Mildred Lydecker, Sec.; Luke Lee, Jr., Plant Mgr. 40,000 tons.

DECATUR

C—Meigs Farmers Cooperative

J. Howard Hornsby, Pres.; G. S. Denton, Jr., V.P.; Edd Norman, Sec. Treas.; Roy C. Ashley, Plant Mgr.

GODWIN

E—International Minerals & Chemical Corp.—Phosphate Minerals Div.

(Main ofc: Chicago, Ill.) F. A. Koechlein, Gen. Mgr.; C. L. Richards, Plant Mgr.

GRAY

C—A. D. Adair & McCarty Bros., Inc.

(Main ofc: Atlanta, Ga.) Sam Sherwood, Supt. 10,000 tons.

GREENEVILLE

Ba—International Minerals & Chemical Corp.

(Main ofc: Chicago, Ill.) Sam B. Broyles, Dist. Sales Mgr.; J. C. Barry, Supt.

HALLS

Ca—Apco Fertilizer Co.

P. O. Box 146; tel: 5091 & 5681. (Affiliated with Mid-South Chemical Co., Memphis, Tenn.) James W. Porter, Pres.; E. L. Figg, V.P. & Pur. Agt.; Mrs. F. W. Finley, Asst. Sec. Treas.; F. W. Finley, Plant Supt. 20,000 tons. 1 mill, 1 ton.

HUMBOLDT

C—Federal Chemical Co.

(Main ofc: Louisville, Ky.) Thomas S. Miller, Plant Mgr.; R. M. Brown, Div. Sales Mgr.; W. M. Stallings, Asst. Div. Sales Mgr.

HUNTINGDON

C—Carroll County Cooperative Supplies Assn.

C. B. King, Pres.; A. T. Abernathy, V.P.; Wm. Pinkley, Sec. Treas.; Earl Newsome, Plant Mgr. 150 tons.

JOHNSON CITY

C—Knoxville Fertilizer Co.

(Main ofc: Knoxville, Tenn.) Plant under construction at time of publication; expect production in Spring of 1956.

KNOXVILLE

B—Knoxville Fertilizer Co.

Old Maryville Pike; P. O. Box 119; tel: 7-4444. James W. Dean, Pres.; N. C. Myers, V.P.; J. C. Dean, V.P.; Scott W. Dean, V.P.; W. B. Hudson, Sr., V.P.; A. Carter Myers, Treas.; Bennett E. Brown, Sec. & Pur. Agt.; Newton H. Hartman, Supt. 155,000 t. cap.; 60,000 t. stor. Several mills; belt conveyors & hoppers. Plants also at Johnson City & Nashville, Tenn. & London, Ky.

LA VERGNE

BaPb—Tennessee Farmers Cooperative

Tel: 901. Paul Quandt, Pres.; Walter P. Webb, V.P.; James W. Endsley, Sec. Treas.; J. Franklin Nix, Gen. Mgr.; Chester Venable, Fert. Mat. Pur. Agt.; W. H. Mitchell, Plant Mgr.; R. Y. Smock, Mgr. Pesticide Div. 30,000 t. cap.; 11,500 t. stor. 1 mill, 1 ton; Payloaders; conveyors to storage bins & from storage bins to shipping mills. Plant also at Tenco, Tenn.

MEMPHIS

C—Armour Fertilizer Works

P. O. Box 2357, DeSota St.; tel: Whitehall 8-1671. (Main ofc: Atlanta, Ga.) H. T. Ray, Div. Mgr.

C—Humphreys-Godwin Co.

H. B. McCarty, Pres.; G. G. Richardson, V.P.; H. B. Cooke, Jr., Treas.-Sec. 100,000 tons.

A—Virginia-Carolina Chemical Corp.

Tel: 4-6216 & 4-6217; factory tel: 4-3080. (Main ofc: Richmond, Va.)

MT. PLEASANT

BE—Virginia-Carolina Chemical Corp.

(Mixed Fertilizer Factory & Phosphate rock mines) Tel: 3207 & 3208. (Main ofc: Richmond, Va.)

NASHVILLE

A—Armour Fertilizer Works

63rd & Centennial Blvd.; P. O. Box 1088 (1); tel: 9-3411, 9-3412. (Main ofc: Atlanta, Ga.) F. H. Conley, Div. Mgr.

Bag—Davison Chemical Corp.—Div. W. R. Grace & Co.

54th Ave., N.; P. O. Box 1009; tel:

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
S—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

9-4536. (Main ofc: Baltimore, Md.) E. S. Jackson, Mgr.

B—Federal Chemical Co., Inc.
49th Ave. & Centennial Blvd. (9); tel: 9-3426. (Main ofc: Louisville, Ky.) John H. Ferguson, Plant Mgr.; Roy B. Nethery, Div. Sales Mgr.; D. T. Morris, Asst. Sales Mgr.

E—Grace Chemical Co.—Div. W. R. Grace & Co.
Old Millington Rd. (Woodstock, Tenn.); P. O. Box 4906; tel: 5-6522. W. J. Haude, V.P. & Gen. Mgr.; J. G. Carriere, V.P. & Plant Mgr.; H. S. King, Comp. 96,000 tons anhydrous ammonia; 55,000 tons urea.

Bpm—Knoxville Fertilizer Co.
Box 118 (2); tel: 42-0559. (Main ofc: Knoxville, Tenn.) Myron T. Myers, Mgr.; Edward McDermott, Supt. 60,000 tons. Mills: belt conveyors; hoppers.

TENCO

BaPh—Tennessee Farmers Cooperative
(Main ofc: LaVergne, Tenn.) E. C. Wilson, Plant Mgr. 30,000 t. cap.; 11,500 t. stor. 1 mill, 1 ton; Payloaders; conveyors to storage bins; hopper system for batching.

UNION CITY

LP*—T & K Fertilizer Co.
L. E. Maloney, Pres., Treas. & Plant Mgr.; Tom Elam, Sec. 800 tons.

O*—West Tennessee Tankage Co.
J. R. Meek, Jr., Pres.; Gordon Cheatham, V.P.; Mrs. S. R. Meek, Jr., Sec.-Treas. 130 tons tankage.

TEXAS

BAY TOWN

E—Consolidated Chemical Industries, Inc.
(Div. ofc: Houston, Tex.) Z. L. Evans, Plant Mgr. Sulfuric acid plant.

BONHAM

BFPbf*—Hi-Yield Fertilizer Co.
P. O. Box 4; tel: LD-1 H. Dean Smith, Pres. & Mgr. Pesticide Div.; Pat Gowan, Plant Supt. 30,000 tons.

BRYAN

C—Bryan Cotton Oil & Fertilizer Co.
Tel: 2-5835. J. W. Howell, Jr., Pres.; Geo. T. Blazek, Sec.-Treas.; J. F. Slowey, Plant Supt. 2,000 tons.

COMANCHE

CagF—Central Texas Fertilizer Co.
P. O. Box 761; tel: 425. Floyd W. Prather, Pres.; Pat Cagle, V.P.; W. M. Durham, Sec.-Treas.; Russell Anderson, Supt. 10,000 t. cap.; 6,000 t. stor. 3 mills, 8-10,000 tons; conveyor belts; continuous mixing & granulation system; 4 tractors.

CRANE

E—Phillips Chemical Co.
P. O. Box 90 (Goldsmith, Tex.) (Main ofc: Bartlesville, Okla.) A. F. Legatski, Plant Supt. 31,025 long tons sulfur.

DALLAS

B—Armour Fertilizer Works
2043 Singleton Blvd.; P. O. Box 5296; tel: FE 5407, 5408, 5409. (Main ofc: Atlanta, Ga.) H. G. Wells, Div. Mgr.

E—Shea Chemical Corp.
(Main ofc: Jeffersonville, Ind.) Fertilizer grade phosphoric acid plant, under construction at time of publication, scheduled for early 1956 operation.

C—Southwest Fertilizer Co.
P. O. Box 12,234; tel: CHapel 7-3333. Walter Gilbreath, Pres.; J. Grady Brown, Jr., V.P.; Norman Wussow, Sec. 3,000 t. cap.; 100 t. stor. 3 hoppers; 6 conveyors; dehydrator; tractor; 3 drainers; sewing machine.

EL PASO

C*—Heid Brothers Corp.
1705 Texas St. E. C. Heid, Pres.; Joseph Heid, Sec.-Treas.; Tirso Guzman, Jr., Whse. Fmn. & Plant Supt. 500 to 1,000 tons.

BagFHPf—Southwest Fertilizer & Chemical Co.
5030 E. Paisano Dr.; P. O. Box 5218, Acarate Branch; tel: Prospect 2-7423. John Ivey, Pres.; W. G. Nelson, Gen. Mgr.; N. D. MacAllister, Sales Mgr.; B. N. Luttrell, Supt.; Bill Williams, Mgr. Pest. Div. 30,000 t. cap.; 7,000 t. stor. Conveyor; scoopmobiles; Payloader. Plant also at Anthony, N. M.

ETTER

E—Phillips Chemical Co.
(Cactus Plant); P. O. Box 277, Dumas, Tex. (Main ofc: Bartlesville, Okla.) C. W. Forman, Plant Supt. Annual production capacity (short tons): 160,600 t. ammonia; 142,000 t. solid nitrate; 55,000 t. nitrogen solution; 130,000 t. nitric acid.

FT. WORTH

C*—Boyer Fertilizer Corp.
R. M. Boyer, Pres.; J. C. Boyer, V.P.; A. V. Doherty, Sec.-Treas.; J. Fred Pettigrew, Plant Mgr.; J. Joe Wilson, Prod. Mgr.; H. M. Shultz, Pur. Agt. 21,000 tons.

E—Consolidated Chemical Industries, Inc.
(Div. ofc: Houston, Tex.) J. A. D. Todd, Plant Mgr. Sulfuric acid plant.

Ba—International Minerals & Chemical Corp.
Stock Yard Sta.; P. O. Box 4545; tel: Northcliff 8257, 8258 & 8259 (Main ofc: Chicago, Ill.) R. I. Gilliland, Dist. Sales Mgr.; J. W. McElheney, Supt.

GILMER

C—Gilmer Cotton Oil & Fertilizer Co.
909 Titus St.; P. O. Box 276; tel: Tilden 3-2216. (Subsidiary of Shreveport Fertilizer Works, Shreveport, La.) Staunton B. Sample, Pres.; W. R. Barrow, V.P.; E. L. Patterson, Sec.-Treas. & Mgr. 15,000 t. cap.; 5,000 t. stor. Mixer; conveyors; Payloaders; sacking machine.

GOLDSMITH

E—Phillips Chemical Co.
P. O. Box 90. (Main ofc: Bartlesville, Okla.) A. F. Legatski, Plant Supt. 36,500 long tons sulfur.

HARLINGEN

BFPf—Kipfer Chemical Co.
1 Mi. West State Hwy.; P. O. Box 770; tel: GA 3-1544. A. E. Kipfer, Owner; Paul Stolfo, Plant Mgr. 20,000 t. cap.; 4,500 t. stor.

HENDERSON

CGPf—Agricultural Chemicals, Inc.
Box 130. (Main ofc: Llano, Tex.) K. M. Lust, Mgr.; J. C. Price, Plant Supt. 5-10,000 tons. 1 ton Sturdevant mixer; 250-ft. conveyor; 100-ft. unloading conveyor; 2 bagging hoppers; pelleting unit.

HOUSTON

A—Armour Fertilizer Works
75th & Memphis Sts.; P. O. Box 1412; tel: WALnut 8-5458. (Main ofc: Atlanta, Ga.) D. A. Miller, Div. Mgr.

E—The Best Fertilizer Co. of Texas
8420 Manchester Ave.; P. O. Box 5337 (12); tel: WALnut 1-1988. (Main ofc: Oakland, Calif.) Russell C. Dillinger, Jr., Plant Mgr. 125,000 tons sulphate of ammonia; 5,000 t. storage capacity; ammonium sulphate units, 600 t./day; various belt conveyors; bagging hoppers, etc.

CP—Campbell Fertilizer Co.
102 Japhet St. (20); tel: CAPitol 5-1405. B. L. Henderson, Sr., Pres.; F. Campbell, V.P.; George H. Seibel, Sec.-Treas.; H. L. Gholson, Plant Supt. 15,000 t. cap.; 5,000 t. stor. 1 mill, 20 t./hr.; 2 Payloaders; 2 fork lifts.

E—Consolidated Chemical Industries, Inc.

Sou. Div. Hdq. ofc: 640 Esperson Bldg. (2); Plant: Walker & Travis; tel: CAPitol 5-5371. (Executive offices: San Francisco, Calif.) E. S. Rothrock, Exec. V.P.; S. S. Emison, V.P. & Sales Mgr.; C. M. Hickey, V.P. & Mgr. of Mfg.; Hubert C. Snowden, Gen. Supt., Sou. Div.; O. D. Massey, Houston Plant Mgr. Sulfuric acid mfgs. Plants also at: Baton Rouge, La.; Baytown, & Ft. Worth Tex.

Duval Sulphur & Potash Co.

General offices, 17th Floor Mellie Esperson Bldg. (2); tel: CAPitol 3-4481. Geo. F. Zoffman, Pres.; Warren J. Dale, V.P.; R. A. Shepherd, V.P.; W. P. Morris, V.P.; Eugene German, V.P. & Treas.; V. J. Thornhill, Sec.; W. B. Wilkerson, Asst. Treas. Sulphur mine at Orchard, Texas; potash mine & refinery at Carlsbad, N. M.

Ca—Fidelity Chemical Corp.

712 N. Shepherd Dr.; P. O. Box 1189; tel: UNDERwood 1-8131. A. Q. Pettersen, Pres.; Jas. D. Dawson, Jr., V.P. & Treas.; Melba Steed, Sec.; Oscar F. Britton, Supt. 20,000 t. cap.; 5,000 t. stor. Hoppers; belt conveyors; Payloaders.

E—San Jacinto Chemical Co.—Div. Smith-Douglass Co., Inc.

P. O. Box 9747 (15); tel: GL 2-7141. (Main ofc: Norfolk, Va.) R. F. Hopkins, Pres.; D. A. White, V.P. & Plant Mgr.; J. H. Lanier, Sales Mgr. Anhydrous ammonia plant.

C—Swift & Co.—Plant Food Div.
P. O. Box 7714; tel: UNDERwood 4-4496 & 4-4497. (Main ofc: Chicago, Ill.) S. B. Tatem, Mgr.

JACKSONVILLE

Ca—Jacksonville Fertilizer Co.
Pineda St. at I & G. N. R. R.; Box 1225; tel: 6103. J. T. Carlisle, Pres.; H. H. Bomar, V.P.; K. S. Carlisle, Sec.-Treas.; R. R. Dunlap, Plant Supt. 10,000 t. cap.; 3,000 t. stor. 1 mill, 1 ton; conveyor belts; 3 Hough Payloaders.

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
a—ammoniate g—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

LA FERIA

L—Texas Liquid Fertilizer Co., Inc.
H. A. Shannon, Pres.; Joseph J. Crosby, V.P.; Chas. E. Shannon, Sec.-Treas.; J. B. Ashworth, Plant Mgr. & Pur. Agt. 5,000 t. cap. (in liquid form); 75 t. stor. Pumps & portable mixers for liquids.

LOS FRESNOS

CPf—Port Fertilizer & Chemical Co.
119 W. Ocean Blvd.; P. O. Drawer W.; tel: Cedar 3-5751. Cleve H. Tandy, Pres.; Clyde Tandy, Jr., V.P.; Douglas C. Early, V.P.; H. F. Meier, Sec.-Treas.; John S. Chase, Asst. Sec.-Treas. & Gen. Mgr.; Sam Baker, Plant Mgr. 75,000 t. cap.; 1,000 t. stor. Soluble fertilizers.

LLANO

Agricultural Chemicals, Inc.
Main ofc: O. C. Behse, Pres.; F. G. Davis, Sec.-Treas.; K. M. Lust, Mgr. & Pur. Agt. Plants at Henderson & Lubbock, Texas.

LUBBOCK

LPf—Agricultural Chemicals, Inc.
(Main ofc: Llano, Tex.)

CFGL—Wood Chemical Co.

P. O. Box 1295. W. R. Wood, Pres. & Pur. Agt.; J. Allen White, V.P. & Mgr. Pesticide Div.; Carl H. Casey, Sec.-Treas. & Supt.; D. R. McKinney, Prod. Mgr. 10,000 tons.

McALLEN

LH—Southwest Chemical Co., Inc.
500 S. 19th; P. O. Box 948; tel: Murray 6-6528. Don E. Mahler, Pres.; Ralph Baldwin, Sec.-Treas.; Guy G. Veal, Plant Mgr. 30,000 tons.

MARSHALL

Ca—Marshall Cotton Oil Co.
1101 E. Grand Ave.; P. O. Box 1149; tel: 5-7964. L. P. Martin, Pres. & Mgr.; George Prendergast, V.P.; Thelma M. Boyett, Sec.-Treas.; R. S. Geddie, Supt. 6,000 t. cap.; 1,800 t. stor. 1 mill; tractor shovels.

MERCEDES

C—Soil Prescription Service
Rte. 2; tel: Logan 5-1978. Nelson B. Armstrong, Owner. 15,000 tons.

MISSION

LPf—Hayes—Sammons Fertilizer Co.
718 Holland Ave.; P. O. Box 633; tel: JU 5-1603. Thomas B. Sammons, Jr., Pres.; C. B. Brazeal, V.P.; Cornelius Vanderulis, Sec.-Treas.; C. W. Weber, Plant Mgr. 50,000 t. cap.; 1100 t. stor.

MOUNT PLEASANT

CaP—Hi-Yield Plant Food Co.
1018 N. Washington; P. O. Box 491; tel: 4-4101, 4-4883. (Main ofc: Bonham, Texas). H. Dean Smith, (Bonham, Tex.) Pres.; Walter M. Young, Mgr.; Buster Candle, Sales; Jewel McNeil, Bkpr.; Welton Shurtleff, Supt., 10,000 t. cap.; 3,500 t. stor. Stedman 1 ton mixer; Payloaders; conveyors. Pesticides formulated in company's Commerce, Tex. plant.

MULESHOE

CFHPm—Western Fertilizer Co., Inc.
Box 398; tel: 2700. Robert King, Pres. & Pur. Agt.; Lloyd Croslin, V.P.; E. G. Pharr, Sec.-Treas.; George Bragg, Supt.; George Stras-kulic, Mgr. Pest. Div. 400 t. cap.;

2,000 t. stor. ½ ton Stedman mixer; Richardson scales & sewing equipment; 2 Hough HA Payloaders.

NACOGDOCHES

BoF—Texas Farm Products Co.

P. O. Box 31; tel: 4-3711. M. S. Wright, Pres.; M. S. Wright, Jr. Gen. Mgr.; G. L. Weaver, Sec.-Treas.; Joe Wright, Prod. Mgr.; Tom Wright, Sales Mgr. & Pur. Agt. (fert. mat.) 50,000 t. cap.; 15,000 t. stor.

ORCHARD

E—Duval Sulphur & Potash Co.

P. O. Box 1032 Rosenberg, Texas; tel: (Wallis, Texas) 24. (Main ofc: Houston, Texas.) X. T. Stoddard, Acting Resident Mgr.; R. C. Molli-son, Pur. Agt. 180,000 tons crude sulphur.

PASADENA

A—Olin Mathieson Chemical

Corp.—Western Fertilizer Div.
Tel: Greenwood 2-3651. (Div ofc: Little Rock, Ark.) J. R. Beatty, Operations Mgr.; J. A. Germany, Operations Supt., George Kelt, (Gulf Bldg., Houston, Texas), Dist. Sales Mgr.

E—Phillips Chemical Co.

(Adams Terminal) P. O. Box 792. (Main ofc: Bartlesville, Okla.) R. G. Rhodes, Plant Supt. Annual production capacity (short tons): 169,725 t. ammonia; 147,800 t. triple superphosphate; 365,000 t. ammoni-um sulfate.

PECOS

LPb—Southwest Fertilizer & Chemical Co.

P. O. Box 107; tel: 888. (Main ofc: El Paso, Texas) C. W. Wesson, Plant Mgr. 20,000 tons.

PLAINVIEW

CFHPf—Rowland & Gordon Co.

700 E. 6th St.; P. O. Box 170; tel: CA 4-6344. Jason O. Gordon, Ptnr. & Mgr.; Manuel Garza, Plant Mgr. 5,000 t. cap.; 300 t. stor. 1 mill, ½ ton; conveyors; shovels.

SAN ANTONIO

C—Agri-Chem of Texas, Inc.

2734 Roosevelt Ave. (4); tel: LEhigh 2-9151. T. Carlton Brayshaw, Pres.; Geo. B. Bancroft, Sec.-Treas. & Plant Mgr. 3,000 tons soluble concentrated fertilizers for dry or liquid application. Mixers; belt & screw conveyors.

EPf—American Potash & Chemical Corp.

(Main ofc: Los Angeles, Calif.)

C—Bactex Co., Inc.

P. O. Box 4065, Sta. A. Robert M. Tobias, Pres.; Geo. J. Pettie, V.P. & Supt. 3,000 tons.

SCPf—Carl Pool Laboratories

420 Kelly Dr.; P. O. Box 1939; tel: WA 2-1246. Carl Pool, Owner & Mgr.; William Pe Vey, Asst. Mgr. 150 tons.

SULPHUR SPRINGS

Bag—Red Star Fertilizer Co.

P. O. Box 486; tel: L.D. 6. Arnold E. Neumann, Mgr.; W. S. Tyler, Technical Advisor; Ewell A. Fox, Ofc. & Credit Mgr. 60,000 t. cap.; 15,000 t. stor. 2 mills, 30,000 t./yr. ea. Complete equipment for acidula-tion, mixing & granulation.

TEXARKANA

Ca—Farmers Fertilizer Co.

S. end Lelia St. at Beaumont St.; P. O. Box 944; tel: 3-3583. H. J. Trammell, Pres. & Pur. Agt.; J. C. Cabe, V.P.; Mrs. H. J. Trammell, Sec.-Treas.; Roy V. Cherry, Supt. 15,000 t. cap.; 10,000 t. stor.; 2 Stedman mills, 40 t./hr. ea.; Stedman bagging unit, 30-40 t./hr.; Fertilizer Equipment Sales Co. hopper system; 400 ft. of 20-in. belt conveyor systems; Hough Payloaders.

O—Great Southern Compost Corp.

4th & Brown; P. O. Box 1229; tel: 32-8781. R. N. Archer, Pres.; L. P. Berry, Jr., V.P. & Gen. Mgr.; J. M. Barnes, Sec.-Treas. 1,500 tons.

TYLER

C—East Texas Products Co.—Div. Swift & Co.

Tel: 48-451. (Main ofc: Chicago, Ill.) W. L. Gray, Plant Mgr.; W. P. Bryans, Supt.; R. J. Ross Pur. Agt.

Ca—Tyler Fertilizer Co.

420 S. Oakland Ave.; tel: 4-7297. H. W. Lust, Ptnr. & Pur. Agt.; W. C. Lust, Ptnr.; Tillman J. Cole, Mgr. 15,000 tons.

UTAH

GARFIELD

E—Western Phosphates, Inc.

P. O. Box 308; tel: Magna 6367. (Associated with Stauffer Chemical Co.) Hans Stauffer, Pres.; E. I. Lentz, V.P. & Gen. Mgr.; E. R. Scammell, Plant Mgr. Treble superphosphate & phosphoric acid.

MARYSVALE

E—The Calumite Corp.

(Main ofc: Altadena, Calif.) Mill & Mines. 180,000 tons alunite.

MIDVALE

BagFHPb—Mineral Fertilizer Co.

150 Sugar St.; P. O. Box 206; tel: AM 5-2721. Frank H. Gunnell, Pres. & Mgr.; Lincoln F. Hanks, Sec.-Treas.; C. Merrill Greenland, Plant Mgr. & Pur. Agt. 12,000 t. cap.; 2,000 t. stor. 2 mills, 15 t./hr. ea.; conveyors; elevators; screens; hopper; 2 Payloaders.

OGDEN

CDP—Greener Plant Food Co.—Div. Producers Livestock Marketing Assn.

Wilson Lane; P. O. Box 584; tel: 6711. (Main ofc: Salt Lake City, Utah.) Joe I. Jacob, Gen. Mgr.; Harold Belliston, Sec.-Treas.; James C. Morgan, Plant Mgr. 5,000 tons (50 t./day). Hopper System; conveyors; elevators; baggers; tractor; Caterpillar; Payloader; dump truck; manure shaker & screening equipment.

PLEASANT GROVE

CaFHPm—Geneva Food & Chemical Co.

Lower State Rd.; P. O. Box 246. Dr. H. C. Millar, Pres. & Gen. Mgr.; Rulon T. Williams, V.P.; Elsie Williams, Sec.-Treas. 7,000 t. cap.; 500 t. stor. 1 mill, 30 t./day; 2 belt conveyors; 1 elevator; hoppers; 1 self-emptying mixer; bagger; sewing equipment; Clark lift truck.

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
S—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

SALT LAKE CITY

CFHPfm—Brown Floral Co.

520 Bothwell St.; P. O. Box 507; tel: 4-5544. Leon Brown, Owner & Mgr. Pesticide Div.; Victor Blair, Plant Mgr. 500 t. cap.; 200 t. stor. 2 mills, 15 t./hr.; hopper system; tractor shovel.

CPb—Kelly-Western Seed Div.—Utah Cooperative Assn.

580 W. 13th St., S.; tel: 84-7671. (A Farmers Union affiliate.) W. B. Robins, Sec. & Gen. Mgr.; Jack E. Horton, Supt. 5,000 tons. 1 mill, 30 t./hr.; hoppers; lifts; baggers; mixers; track loading facilities, etc.

Producers Livestock Marketing Assn. Plant at Ogden, Utah.

O—Utah By-Products Co.

463 S. 3rd St., W.; tel: Empire 4-2818. P. H. Soble, Mgr. Several rendering plants producing tankage & meat scrap.

Utah-Idaho Sugar Co.

David O. McKay, Pres.; D. E. Scallie, V.P. & Gen. Mgr.; J. A. Wood, V.P. & Asst. Gen. Mgr.; D. C. Lane, V.P. & Sales Mgr.; T. W. Cockayne, V.P. & Sec.-Treas.; Bion Tolman, Gen. Ag. Supt. Plant at Idaho Falls, Idaho.

CaLPfm—Wassatch Chemical Co.

2225 S. 5th St., E.; tel: 84-7661. N. D. Thatcher, Jr., Pres. & Mgr.; L. W. Thatcher, Sec.; W. L. Thatcher, Plant Mgr.; Dr. A. L. Stark, Mgr. Pest. Div. 25,000 t. cap.; 5,000 t. stor. 1 mill, 30 t./hr.; completely mechanized for bulk handling & batching.

WOODRUFF

E—Pearl Phosphate Co.

Shipping point: U.P.R.R., Evanston, Wyo. (Main ofc: W. Covina, Calif.) Phosphate rock mine.

VERMONT

BURLINGTON

CaFGH—Burlington Rendering Co.

1119 North Ave.; P. O. Box 228; tel: 3-3591. (Main ofc: Consolidated Rendering Co., Boston, Mass.) W. P. Mitchell, Mgr.; R. F. Gero, Supt. 5,000 t. cap.; 5,000 t. stor. 2 mills, 25 t./hr.; tractors.

VIRGINIA

ALEXANDRIA

A—The American Agricultural Chemical Co.

411 N. Lee St.; P. O. Box 589; tel: Overlook 3-0135. (Main ofc: New York, N. Y.) J. H. Brown, Mgr.; A. W. Powell, Jr., Supt.

CaFH—Herbert Bryant, Inc.

201 King St., tel: King 9-3500. J. C. Herbert Bryant, Pres.; J. T. Bowling, Sec. & Pur. Agt.; Arthur K. Claxton, Treas.; C. Gordon Smith, Asst. Treas.; A. N. Pierce, Supt. 25,000 t. cap.; 5,000 t. stor.

BLACKSTONE

CF—Blackstone Guano Co., Inc.

Nottoway Ave.; P. O. Box 388; tel:

50. W. C. Rives, Jr., Pres.; S. S. Harris, Supt. 6,500 t. cap.; 5,000 t. stor. 1 mill, 100 t./day; hopper; conveyor; hydraulic lift; 2 Payloaders.

BRISTOL

C—Southwest Virginia Cooperative, Inc.

RFD 1; tel: North 4653. R. H. Snodgrass (Glade Spring, Va.), Pres.; S. J. Shelburne (Pennington Gap, Va.) V.P.; Orville B. Helton, Sec. & Gen. Mgr.; Jack W. Gobble, Treas.; M. H. Overstreet, Plant Mgr. 20,000 t. cap.; 9,000 t. stor. 2 mills, 125 t./day; 190-ft. overhead belt conveyor system; truck loading conveyors; 4 Payloaders; 2 bagging units with scales; built-in scales for weighing tractor loads.

BUELL

C—F. S. Royster Guano Co.

Money Point; P. O. Drawer 1940, Norfolk, Va. C. R. Wimbish, Supt.

CHILHOWIE

CPf—The Vance Co., Inc.

Q. A. Eller, V.P. in charge of Fert. Mfg.; J. M. Duncan, Treas. & Mgr. W. N. Neff, Gen'l Mgr.; Robert Ferguson, Supt.; Wm. C. Kelly, Mgr. Pesticide Div. 10,000 t. cap.; 3,000 t. stor. Payloader.

CULPEPER

CF—Cooperative Fertilizer Service of Richmond, Inc.

P. O. Box 749; tel: 9020. (Main ofc: Richmond, Va.) R. H. Carwile, Plant Mgr. 10,000 t. cap.; 1,500 t. stor. 1 mill, 40 t./hr.; elevators; hoppers; Payloaders.

DANVILLE

C—Smith-Douglass Co., Inc.

P. O. Box 109. (Main ofc: Norfolk, Va.) P. J. Searce, Branch Mgr.

ELLERSON

CaFH—Alliance Fertilizer Corp.

B. H. Garrett, Pres.; R. T. Avery, V.P.; E. R. Dodson, Sec.; S. A. Oliver, Treas.; A. B. Palmer, Supt. 7,000 t. cap.; 2,400 t. stor. Atlanta Utility mill, 30 t./hr.; unloading elevator; 2 50-ft. stationary conveyors; 2 40-ft. shuttle conveyors; 1 St. Regis valve bag packer; Payloaders. Plant also at Milford, Va.

C—Bradley & Boswell

Tel: (Mechanicsville) 5035. Frank B. Bradley, Sr., Pres.; Frank B. Bradley, Jr., Sec.-Treas.; C. L. Dunn, ofc. Mgr.; H. W. Bradley, Plant Supt. 10,000 t. cap.; 3,500 t. stor. 2 mills, 40 t./hr.; conveyors; tractor loader; 2 tractor shovels.

HARRISONBURG

CaFPm—The Central Chemical Corp.

P. O. Box 7; tel: 4-6751. (Main ofc: Hagerstown, Md.) John Babbage, Plant Mgr. 15,000 t. cap.; 7,500 t. stor. 3 mills, 5,000 t./yr. ea.

HOPEWELL

E—Nitrogen Div.—Allied Chemical & Dye Corp.

P. O. Box 61; tel: 871. (Main ofc: New York, N. Y.) F. A. Ernst, Mgr. Ammonia, Nitrogen fertilizer solutions, Ammonium nitrate-limestone and Sodium nitrate.

KENBRIDGE

CaF—Farmers' Cooperative Fertilizer Purchasers, Inc.

P. O. Box 366; tel: 2511. C. H. Stevens, Pres.; E. S. Roby, Jr., V.P.; W. S. Manson, Jr., Sec.-Treas.; E. C. Johnson, Jr., Asst. Sec.-Treas.; T. R. Cocks, Plant Mgr. 18,000 t. cap.; 1500 t. stor. 2 mills, 25 t./hr.; mixer, 1 ton; bagger; 3 tractor shovels; belt conveyors.

LYNCHBURG

C—F. S. Royster Guano Co.

RFD 2; P. O. Box 353. (Main ofc: Norfolk, Va.) J. L. Adamee, Supt.

A—Virginia-Carolina Chemical Corp. Tel: 2-6433. (Main ofc: Richmond, Va.)

MILFORD

CaFH—Alliance Fertilizer Corp.

Tel: (Bowling Green) 3-2371. (Main ofc: Ellersson, Va.) A. B. Palmer, Supt. 5,000 tons. Sackett mill, ½ & 1 ton; conveyors; automatic bagger; Payloaders.

MOUNT JACKSON

BaF—Valley Fertilizer & Chemical Co., Inc.

George B. Holtzman, Pres. & Mgr.; L. D. Arnold, Sec.-Treas.; Martin L. Miller, Foreman 10,000 t. cap.; 4,000 t. stor. 1 mill 20 t./hr.; tractor shovels.

NORFOLK

C—Armour Fertilizer Works

Ofc: 908 Bank of Commerce Bldg.; Plant: Money Point; tel: MADison 2-4525. (Main ofc: Atlanta, Ga.) F. G. Carlisle, Div. Mgr.

Cornet Phosphate Co.—Div. Smith-Douglass Co., Inc.

General office. Board of Trade Bldg.; P. O. Box 291; tel: MADison 2-3211. R. S. Rydell, Pres. Plant at Plant City, Fla.

B—Farmers Guano Co.

Money Point; P. O. Box 4526, Berkeley Sta. 6; tel: Kimball, 5-1231. (Main ofc: Farmers Cotton Oil Company, Wilson, N. C.) Ben H. Ottinger, Mgr. 50,000 t. cap.; 25,000 t. stor. 2 mills, 40 t./hr. batch hoppers; 2 conveyors; 2 shuttle conveyors; 1 cross conveyor; tram car; tractors.

C—Nichols Fertilizer Corp.

Freeman Ave., Money Point; P. O. Box 4598, Berkeley Sta. 6; tel: Kimball 5-2489. W. L. Nichols, Pres. & Treas.; W. R. Jordan, V.P.; R. F. Nichols, Sec.; E. D. Culpepper, Supt. 20,000 t. cap.; 10,000 t. stor. 2 mills. 1¼ & 1 ton; Savage hopper system; Union Special sewing equipment; Hough Payloaders, etc.

CaGPm—Chas. W. Priddy & Co., Inc.

Ofc: 114 W. Brambleton Ave.; Plant: Money Point, S. Norfolk; P. O. Box 900 (1); tel: MADison 2-2614. Sydnor Y. Priddy, Pres.; A. L. Ridgwell, J. S. Hand, V.P.s; Chas. O. Lawrence, Sec.-Treas.; T. A. Branch, Supt. 60,000 t. cap.; 20,000 t. stor. 2 mills, 40 t./hr.; hopper systems; conveyors; tractor shovels; granulator being prepared for at time of publication.

A—Robertson Chemical Corp.

Ofc: 429 Wainwright Bl.; Plant: S. Norfolk; P. O. Box 1321; tel: MADison 2-5752. General offices: C. B. Robertson, Pres.; J. E. Ames,

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
a—ammoniate **g**—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

Jr., V.P.; J. Morton Eggleston, Sec.; R. Skelton Eggleston, Treas.; J. L. Eley, Jr., Asst. Treas.; C. W. Best, Prod. Mgr.; S. H. Hall, Norfolk Plant. Supt. 75,000 tons. Plants also at: Raleigh, Statesville & Wilmington, N. C.; South Hill, Va.

F. S. Royster Guano Co.

Royster Bldg.; P. O. Drawer 1940 (1). General office. C. F. Burroughs, Sr., Pres.; W. T. Wright, F. S. Moore, & Chas. F. Burroughs, Jr., V.P.'s; Sheppard R. Cooke, Sec.; J. F. George, Prod. Mgr.; J. M. Wood, Gen. Supt. Plants at: Bessemer & Montgomery, Ala.; Mulberry, Fla.; Athens, Atlanta & Macon, Ga.; Indianapolis, Ind.; Baltimore, Md.; Jackson, Miss.; Lyons, N. Y.; Charlotte & Navassa, N. C.; Charleston & Spartanburg, S. C.; Buell, Lynchburg & S. Norfolk, Va.; Madison, Wisc.

A—Smith-Douglass Co., Inc.

General offices. Board of Trade Bldg.; P. O. Box 419 (1); tel: MADison 2-3211. R. B. Douglass, Pres.; W. R. Ashburn, V.P. & Gen. Counsel; W. B. Copeland, Exec. V.P.; J. A. Monroe & J. H. Culpepper, V.P.'s; J. H. Zwemer, Gen. Mgr. Prod. & Research; D. C. Kieffer, Tech. Dir. Plant; M. W. Darden, Branch Mgr. Plants also at: Stretator, Ill.; Albert Lea, Minn.; Kingston & Wilmington, N. C.; Danville, Va.

O—Smith-Rowland Co.—Div. Smith-Douglass Co., Inc.

2nd Fl. Board of Trade Bldg.; P. O. Box 1219 (1); tel: MADison 2-7155. R. B. Douglass, Pres.; J. A. Monroe, V.P.; W. F. Powers, Sec.; R. E. Spivey, Mgr. Nitrogenous tankage at Norfolk. Plants also at: Selbyville, Del.; Granite City, Ill.

A—Swift & Co.—Plant Food Div.

Ofc: 627 Wainwright Bldg.; P. O. Box 1177; tel: Kimball 5-4193. (Main ofc: Chicago, Ill.) W. J. Richardson, Mgr.

AaFpm—Weaver Fertilizer Co., Inc.

Ofc: 807 Bank of Commerce Bldg., 300 E. Main St.; P. O. Box 1786; tel: MADison 2-6591 & 2-6592. A. W. Weaver, Pres.; C. W. Bradshaw, V.P. & Pur. Agt.; B. P. Eggleston, Sec.; E. A. Darden, Treas.; E. E. Towe, Supt. 60,000 t. cap.; 30,000 t. stor. 5 mills, 300 t./day each; hopper system; 3 conveyors; 10 tractor shovels. Plant also at Winston-Salem, N. C.

PORTSMOUTH

C—Baugh & Sons Co.

P. O. Box 890; tel: 7-4687. (Main ofc: Baltimore, Md.) E. A. Barker, Sales Mgr.; A. C. Hill, Supt.

A—Virginia-Carolina Chemical Corp.

Tel: 9-1141. (Main ofc: Richmond, Va.)

RICHMOND

CaF—Bone Dry Fertilizer Co.

16th & Brown Sts.; P. O. Box 1655; tel: 2-0188. Ben B. LeCompte, Owner; P. Croxton Lewis, Plant

Mgr. 20,000 tons. 2 mills, 40 t./hr. each.

Cooperative Fertilizer Service of Richmond, Inc.

Home Office. Southern States Bldg. W. T. Steele, Jr., Pres.; A. Preston Sale, Jr., V.P.; Jas. R. Ayers, Jr., Sec.; Miss Louise Ruley, Asst. Sec.; K. R. Eckles, Treas.; F. M. Armbrrecht, Asst. Treas. Plants at: Louisville & Winchester, Ky.; Culpeper, Va.

BFPm—Richmond Guano Co.

9 S. 5th St.; P. O. Box 544; tel: 2-5861. W. E. Barret, Pres.; W. B. Badenoch, V.P.; L. Dudley George, Sec.-Treas. Prod. Mgr. & Pur. Agt.; Wm. B. Badenoch, Jr., Asst. Sec.; R. A. Bell, Asst. Treas.; 60,000 tons. 3 mills; belt conveyors; part hopper systems; pneumatic material handling system; fork trucks, etc.

A—Virginia-Carolina Chemical Corp.

General Offices. tel: 2-0113; factory tel: 2-9363. J. A. Howell, Pres.; C. Cecil Arledge, Edwin Cox, A. J. Dickinson & Chas. E. Heinrichs, V.P.'s; Irving D. Dawes, V.P. & Treas.; George G. Osborne, Sec. Plants also at: Birmingham, Dothan, Mobile, Montgomery & Wyllam, Ala.; Little Rock, Ark.; Jacksonville & Nichols, Fla.; Albany, Atlanta, Augusta, Rome & Savannah, Ga.; E. St. Louis, Ill.; Ft. Wayne, Ind.; Dubuque, Ia.; Hopkinsville, Ky.; Shreveport, La.; Baltimore, Md.; Jackson, Miss.; Carteret, N. J.; Charlotte, Durham, Selma, Wadesboro & Wilmington, N. C.; Cincinnati, Ohio; Charleston & Greenville, S. C.; Memphis & Mt. Pleasant, Tenn.; Lynchburg & Portsmouth, Va. (Construction plans announced for additional plants at: Remington, Ind.; Estherville, Ia.; Orrville, O.) **Phosphate Mining Div.:** Mines at Nichols, Fla. & Mt. Pleasant, Tenn. **Chemicals Div.:** Plants at Nichols, Fla.; Fernald (Cincinnati), Ohio; Charleston, S. C.

SOUTH HILL

CaFH—Robertson Chemical Corp.

Tel: 30. (Main ofc: Norfolk, Va.) S. P. Anderson, Plant Mgr. 10,000 t. cap.; 6—7,000 t. stor. 2 mills; tractors; Payloaders.

SOUTH NORFOLK

C—The American Agricultural Chemical Co.

Money Point; P. O. Box 4568, Berkley Sta., Norfolk 6; tel: Virginia 66-4627. W. W. Edwards, Mgr.; A. J. Fitzula, Supt.

Ca—Cooperative Fertilizer Service of Norfolk, Inc.

Military Hwy. at N. & W. R. R. & Sou. Branch Elizabeth River; P. O. Box 777, Norfolk 1; tel: Kimball 5-2449. W. T. Steele, Jr., Pres.; A. P. Sale, Jr., Exec. V. P.; M. G. Mann, V.P.; K. R. Eckles, Treas.; James R. Ayers, Sec.; M. K. Hassell, Plant Mgr. 100,000 t. cap.; 25,000 t. stor. 1 mill, 1,000 t./day; Hopper systems; conveyors; tractor shovels; Payloaders; a automatic valve machine.

CaPbm—Reliance Fertilizer & Lime Corp.

Barnes Rd. & Belt Line R. R.; P. O. Box 4596, Berkley Sta., Norfolk 6; tel: Kimball 5-3543. J. J. Joyce, Pres.; R. S. Hill, V.P.; C. G. Lawrence, V.P.; V. C. Have, Sec.; L. W. Wilson, Supt. 25,000 t. cap.; 12,000 t. stor. 1 mill, 1½ ton; hopper system; conveyors; tractors.

A—F. S. Royster Guano Co.

Ft. of Ohio St.; P. O. Box 1940, Norfolk 1 (Main ofc: Norfolk, Va.) J. Felix Walker, Supt.

SUFFOLK

C—Dixie Guano Co., Inc.

H. L. Bain, Pres.; R. G. Bain, V.P.; P. Wilson, Sec.-Treas. & Gen. Mgr.; L. M. Daniel, Plant Mgr. 15,000 tons.

WASHINGTON

ELLENSBURG

LH—W. Brotherton Seed Co.

802 S. Pearl; P. O. Box 720; tel: 2-6726 W. Brotherton, Pres.; A. T. Romano, Mgr. Fert. Oper. 2,000 t. cap.; 60 t. stor. Mixers; pumps; tanks; 2 tractors; field applicators.

CaFLHPm—Charles H. Lilly Co.

(Main ofc: Seattle, Wash.) Lee Fryer, Mgr. 8,000 t. cap.; 5,000 t. stor. Semi-automatic plant.

LYNDEN

CPI—Lynden Department Store, Inc.

P. O. Box 33; tel: 1801. W. H. Waples, Pres.; L. G. Judson, V.P. & Treas.; Peter Koert, Sec.; Clarence Bode, Plant Mgr. 4,000 t. cap.; 400 t. stor. 1 mill, 1 ton; Payloader.

MONROE

CFPbm—Shur-Crop Corp.

P. O. Box 126; tel: 2492. M. V. Wolfkill, Pres.; R. G. Herzog, V.P. & Mgr.; V. J. Wolfkill, Treas.; Ted Briten, Mgr. Pest. Div. 15,000 t. cap.; 1,000 t. stor. 1 mill, ½ ton; belt conveyor from siding to leg distributes bulk material to any of 8 bulk bins; also charges 8 4-ton overhead bins which feed into scale hopper, then to mixer.

MT. VERNON

LHDPb—Hansen & Peterson Feed & Seed

N. 1st; tel: EDgewater 6-3139. Oscar Peterson & Chris Hansen, Ptnrs.; Dick South, Plant Mgr. 2,000 t. cap.; 300 t. stor.

CaFLHPm—Charles H. Lilly Co.

(Main ofc: Seattle, Wash.) Lee Fryer, Mgr. 7,000 t. cap.; 5,000 t. stor. Semi-Automatic Conventional equipment.

QUINCY

C—Pacific Supply Cooperative—Chemical Div.

P. O. Box 217. Hank Baur, Mgr.

SEATTLE

SOL—Alaska Fertilizer Co.

84 Seneca St.; tel: MA 4417, AL 6390; E. J. Wolf, Owner & Pur. Agt.; Miss E. G. Becker, Ofc. Mgr.; H. E. Howard, Sales Mgr.; Ed Sheeley, Plant Mgr., 10 carloads cap.; 110 t. stor. Mfg. liquid fish fertilizers in small package line. Mix-

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
s—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

ers; elevators; filling machines; capping machines; conveyor system.

CPb—J. W. Dunn & Co.

1912 Pike Pl.; tel: MAin 3924. H. W. Foster, Owner, Jack Jones, Plant Mgr. 1,500 t. cap.; 1,000 t. stor. 1 mill; ½ ton mixer.

CPb—Galbraith & Co.

2428 Alaskan Way. B. F. Morris, Pres.; F. S. Bogue, Treas.; Garnet G. Morris, Sec.; A. R. Burkette, Supt. & Mgr. Pesticide Div. 3,500 tons. 2 mills, 1 & 2 ton; 3 bucket elevators.

O—James Henry Packing Co.

2025 Airport Way; tel: SE 1220. H. A. Kurtzman, Pres.; A. V. Ross, V.P., Treas. & Mgr.; Keneth A. Cole, Sec. 300 tons wet rendered tankage.

Chas. H. Lilly Co.

1900 Alaska Way; tel: MAin 8484. General offices. C. F. Larsen, Pres. & Gen. Mgr.; E. E. White, Sec. Treas.; Lee Fryer, Mgr. Fert. Dept.; George Petrie, Mgr. Pest. Div. Plants at: Ellensburg & Mt. Vernon, Wash.

CD—Magnolia Fertilizer Co.

1144 Ballard Way; tel: Dex 0054. H. Waltersdorph, Pres.; Florence Waltersdorph, V.P.; R. Franklin, Sec.; E. B. Helgeson, Treas., Prod. Mgr. & Pur. Agt.; Harry Renken, Supt. 3,000 tons.

CPfm—Marine By-Products Fertilizer Co.

3308 Harbor Ave., S.W.; tel: AVa-lon 1941. Willis R. Lebo, Owner; Ted McMann, Supt. 10,000 t. cap.; 2,000 t. stor. 5 mills (100, 80, 50, 20 & 10 hp.) bone 1 t./hr., organic 10 t./hr.; bulking conveyor; crane; automatic bins; tractor shovel.

CagPm—Oregon-Washington Fertilizer Co.

2218 Airport Way; P. O. Box 3324; tel: MAin 6729. Mac C. Taylor, Pres.; Frank W. Taylor, Treas.; R. M. Laughland, Supt. 10,000 t. cap.; 5,000 t. stor. 10 t./hr. TVA ammoniator, granulator & dryer; dry mix hopper system; 3 ton mixer; power scoop trucks. Plant also at Portland, Ore.

CLPfm—Wilbur-Ellis Co.

2900 11th Ave., S.W.; tel: EL 3135. (Main ofc: Los Angeles, Calif.) R. B. Mattson, V.P. & Mgr.; Roy Weaver, Asst. Mgr. John Stevens, Supt. Robert H. Allard, Mgr. Pest. Div. 12,000 t. cap.; 2,000 t. stor. 2 mills, 4 & 10 t./hr.; 2 Payloaders; 3 lift trucks; bulk unloading system; 9 bulk storage bins (200 tons each); Complete dry fertilizer mixing unit; complete liquid mix unit; dry insecticide unit.

LHDPb—Washington Cooperative Farmers Assn.

201 Elliott Ave., W. (99); tel. GA 0355. H. J. Beernink, Gen. Mgr.; F. T. Tremblay, Mgr. Fert. & Farm Chem. Dept. Mix liquid fertilizer & distribute dry mixes; 50 outlets in state, with 5 offering applicator service. 20,000 t. cap.; 5,000 t. stor.

TACOMA

CPm—Nulife Fertilizers—Div.

HYGrade Food Products, Inc. 2031 Lincoln Ave.; P. O. Box 1636 (1); tel: BRoadway 7300. (Main ofc:

Detroit, Mich.) Fred P. Parcher, Mgr.; George M. Harrison, Asst. Mgr.; John Pieterman, Plant Mgr. 25,000 t. cap.; 5,000 t. stor. Hopper systems; elevators; conveyors; Payloaders; air compressors.

B—Stauffer Chemical Co.

Pacific Northwestern Div. 2545 Lincoln Ave. (2); tel: Market 8103. (Main ofc: New York, N. Y.; Western Div. ofc: San Francisco, Calif.) John B. Wheeler, Plant Supt.

WALLA WALLA

LH—Tusko Fertilizer Co.

City-County Airport; tel: 8514. Wells Labberton, Pres. & Gen. Mgr. 700 tons storage.

O—Walla Walla Meat & Cold Storage Co.

N. 4th Ave.; Box 336; tel: 177. Mrs. F. M. Lodden, Jr., Pres.; Eugene Tausick, V.P.; Theodore R. Rich, Treas. & Gen. Mgr.; Harold Banks, Sec.; John Hargert, Prod. Mgr.; Mrs. Tharpe, Pur. Agt. 222 tons animal by-product, 21 tons, dried blood. 1 mill, 2 tons daily.

WAPATO

LHP—Washington Liquid Fertilizer Co.

211 W. First St.; tel: 9-3491. W. L. Mayo, Pres. & Pur. Agt.; Geo. H. Pitt, Sec.-Treas.; Phil Mirosh, Plant Mgr.; Lloyd Bordelon, Mgr. Pest. Div. 25,000 t. cap.; 500 t. stor.

WENATCHEE

CF—Wells & Wade, Inc.

L. C. Norlin, Mgr.; Chas. G. Slick, Treas.; Lehm L. Brown, Sec.; E. W. Baker, Plant Mgr.; E. E. Kingston, Pur. Mgr. 5,000 tons.

YAKIMA

O—Washington Organic Fertilizer, Inc.

409 Masonic Temple. L. M. Sanders, Pres.; Lane Morthland, V.P.; O. J. Reynolds, Sec.-Treas. & Plant Mgr.

CgPfm—Yakima Valley Spray Co.

1108 S. 1st St.; P. O. Box 513; tel: 3-7197. R. L. Maultsby, Pres.; A. J. Weeber, V.P.; S. W. Martin, Sec. & Gen. Mgr.; C. B. Stoll, Treas. 15,000 t. cap.; 1,500 t. stor. 3 mills; lift truck.

WEST VIRGINIA

CHARLES TOWN

CaFPfm—Miller Chemical Corp.

F. T. Fiery, Pres.; S. H. Stone, V.P.; W. Newton Long, Treas.; Ira Springer, Plant Supt. 15,000 t. cap.; 6,000 t. stor. 2 mills, 30 t./hr.; rotary mixer; bag packer; hopper systems; conveyors; Payloaders.

MORGANTOWN

E—Olin Mathieson Chemical Corp.

Tel: 3491. (Main ofc: Baltimore, Md.) M. B. Wright, Mgr. Ammonia Plant.

WISCONSIN

ANTIGO

CaFPfm—Wisconsin Farmco Service Cooperative

N. Edison St.; P. O. Box 7; tel:

3-4882. (Main ofc: Madison, Wisc.) Herman Wolfgram, Plant Supt. 12,000 t. cap.; 4,000 t. stor. 1 mill; hopper system; bucket elevators; belt conveyors; dust collectors; scales; packer; pre-weigher; Payloaders.

CAMERON

CFPbm—Wisconsin Farmco Service Cooperative

(Main ofc: Madison, Wisc.) Duane Behm, Plant Supt.

CARROLLVILLE

O—United Fertilizer Co.

Tel: SO 2-1068. F. L. Weyenberg, Pres.; Charles P. Vogel, V.P.; Carl Greilach, Treas.; R. Rolke, Sec.; R. Twinem, Supt. 50,000 tons nitrogenous tankage; plant completely mechanized.

GREEN BAY

AagFPb—Northwest Cooperative Mills

Bylsby Ave.; P. O. Box 1164; tel: Hemlock 5-1355. (Main ofc: St. Paul, Minn.) Tom O'Brien, Plant Mgr.; Porter Plumley, Plant Supt. 30,000 t. superphosphate & 50,000 t. mixed goods; 10,000 t. stor. Sturtevant acidulator; 6 tractors; 2 Hy-sters; basing mill & shipping mill, 30 t./hr.; 13 conveyors; Syntrol scale hopper system (6 hoppers).

CagFPbm—Wisconsin Farmco Service Cooperative

P. O. Box 1132; tel: Hemlock 2-1406. (Main ofc: Madison, Wisc.) Byrl Sotzen, Plant Supt. 30,000 t. cap.; 10,000 t. stor. 1 mill, 25 t./hr.; screws; elevators; screens; pulverizers; hoppers; belt conveyors; mixer; scales; packers; Hough Payloaders.

HILLSBORO

CaFPm—Kickapoo Fertilizers—Div.

Midwestern Phosphate Corp. P. O. Box 96; tel: 51. (Main ofc: Madison, Wisc.) R. B. Baldrige, II, Asst. Mgr. 15,000 tons.

KENOSHA

CgPfm—The N. S. Koss & Son Co.

4500 13th Ct.; tel: OLympic 4-5301. Mrs. Grace Koss Anderson, Pres. & Pur. Agt.; Donald W. Anderson, V.P.; Mary A. Koss, Sec.-Treas.; Lee Hagopian, Supt.; Charles B. McIntyre, Mgr. Pest. Div. 60,000 t. cap.; 25,000 t. stor. 1 mill.

MADISON

Midwestern Phosphate Corp.

1 S. Pinckney St.; P. O. Box 948 (1); tel: ALpine 7-1466. Donald W. Aitken, Pres., Treas. & Gen. Mgr.; A. D. Strobhar, V.P. Plant at Hillsboro, Wisc.

A—F. S. Royster Guano Co.

Dempsey Rd.; P. O. Box 28. (Main ofc: Norfolk, Va.) T. M. Williams, Supt.

C—Swift & Co.—Plant Food Div.

703 Swift Ave.; P. O. Box 152; tel: 4-3516, 4-3517. (Main ofc: Chicago, Ill.) W. J. Klossner, Mgr.

Wisconsin Farmco Service Cooperative

General offices. 18 S. Thornton Ave. (1); tel: CHerry 4-6231. Curtis Hatch, Pres.; Ray L. Pavlak, Gen. Mgr.; Clifford J. Kindschi, Dir. Oper.; Stanley S. Schaefer, Mgr.

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
a—ammoniate g—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

Plant Food Dept. Plants at: Antigio, Cameron, Green Bay, Prairie du Chein, South Wayne & White-water, Wisc. Gross cap. 118,000 t.; gross stor. 40,000 t.

MILWAUKEE

O—Sewerage Commission of the City of Milwaukee

Ray D. Leavy, Chief Eng. & Gen. Mgr.; O. J. Noer, Agronomist & Sales Mgr.; Charles G. Wilson, Agronomist; William Landsiedel, Plant Mgr. 70,000 tons tankage; 20,000 t. stor. cap. 6 mills, 10 t./hr. each; belt conveyors; screw conveyors; elevators; 5 baggers; 1 lift truck; conveyors for loading.

NEILLSVILLE

CFPm—H. H. Van Gorden & Sons
700 Grand Ave.; tel: 88. K. S. Van Gorden, R. H. Van Gorden & H. A. Van Gorden, Ptnrs. 3,000 t. cap.; 1,000 t. stor. 1 mill, ½ ton; Tow-motor Shovel.

PRAIRIE DU CHIEN

BagFPbm—Wisconsin Farmco Service Cooperative
Front & Wells St.; P. O. Box 30; tel: 425 & 426. (Main ofc: Madison, Wisc.) Lyle J. Barndt, Plant Supt. 65,000 t. cap.; 14,000 t. stor. Hopper systems; conveyors; tractor shovels.

SOUTH WAYNE

CFPbm—Wisconsin Farmco Service Cooperative
P. O. Box 91; tel: 127. (Main ofc: Madison, Wisc.) James B. Harker, Plant Supt. 5,000 t. cap.; 1,000 t. stor. Pulverizer; screen; bucket elevator; conveyors; Payloaders.

WATERTOWN

CFPbm—Wisconsin Plant Food, Inc.
1001 2nd St.; P. O. Box 238; tel: 1618. Paul H. Hornburg, Pres., Sec.-Treas. & Plant Mgr.; Irma Hornburg, V.P. 5,000 t. cap.; 1,500 stor. 1 mill; conveyor; Payloader.

WHITEWATER

BagFPbm—Wisconsin Farmco Service Cooperative
Rte. 1; P. O. Box 88; tel: 126. (Main ofc: Madison, Wisc.) Robert J. Sachscha, Plant Supt. 21,000 t. cap.; 6,000 t. stor. 6 compartment compounding hopper; multiple conveyors; 3 Payloaders.

WYOCENA

CDPb*—Wyocena Farmers Co-Operative Co.
Tel: 6-J Leo Link (Cambria, Wisc.), Pres.; Wayne Mountford (Poynette, Wisc.), V.P.; G. W. Spear, Sec.-Treas. & Plant Mgr.; Marvin Spear, Mgr. Pest. Div. 3,000 tons. 1 mill; Stedman fertilizer unit.

WYOMING

FT. LARAMIE

E*—Fl. Laramie Fertilizer Co.
Marie C. Hunts, Owner. Mine & sell natural mineral elements.

KEMMERER

E*—Phosphate Minerals, Inc.
Tel: 37. Karney Redman, Pres.; Joseph Profaizer, V.P.; Keiji Nakamura, Sec.-Treas.; Matt Bertag-

nolli, Gen. Mgr. & Pur. Agt.; Oliver Kampman, Plant Mgr. 3,000 tons. (Cap: 25,000 tons.) 2 Raymond mills, 4 t./hr.; 3 belt conveyors; 4 bucket elevators; 90 x 7-ft. rotary kiln; 7 hopper systems; 3 screw conveyors.

SAGE

E*—San Francisco Chemical Co.
c/o Leefe Mind. D. L. King, Pres.; Rex L. Jones, Sec.-Treas.; Preston S. Pugnire, Supt.; Wm. Eschler, Plant Mgr. 250,000 tons.

THERMOPOLIS

E—Pacific Coast Fertilizer Co.
Tel: 55. (Main ofc: 1001 Northern Life Tower.) D. R. Girdwood, Pres.; Kenneth P. Hutton, Gen. Mgr.; W. T. Hardendorf, Supt. mine sulfur & gypsum ore.

E—Wyoming Minerals Corp.
(Subsidiary of Jespersion, Inc., Omaha, Nebr.)

ALASKA

KETHCHIKAN

O*—Salmon By-Products Co., Inc.
Willis R. Lebo, Pres.; Willis R. Lebo, Jr., V.P. & Mgr.; Martha C. Lebo, Sec. 1,500 tons fish meal (capacity 1,000 t./mo.; seasonal operation, 1½ months per yr.)

HAWAIIAN ISLANDS

HONOLULU, OAHU, T. H.

AGPbf*—Pacific Chemical & Fertilizer Co.
Main ofc: 311 Pacific St., Iwilei; P. O. Box 48 (10); tel: 5-3991. Ronald Q. Smith, Pres. & Gen. Mgr.; H. C. Eichelberger, F. W. Broadbent, W. G. Hewitt & G. B. Hayes, V.P.s.; G. A. W. Hart, Treas. & Asst. Sec.; M. A. Pietschman, Sec.; J. S. Williamson, Asst. Treas.; W. J. L. Wilson, Gen. Supt.; C. J. Fette, Plant Supt. 50,000 tons. 2 mills, 25,000 tons each; conveyors & hopper systems, etc.; equipment by Sturdevant, Stedman, Bradley, Union Special, Clark, Hough, Austin-Western. Plants also at: Hilo, Kahului & Puihi; Mainland ofc: Berkeley 10, Calif.

HILO, HAWAII, T. H.

CP—Pacific Chemical & Fertilizer Co.
60 Kuhio Wharf Rd.; P. O. Box 395; tel. 3913, 4375. (Main ofc: Honolulu, Oahu.) E. L. Harker, Plant Mgr. 50,000 t. cap.; 15,000 t. stor. 2 mills, 25 t./hr.; conveyors; hopper systems; power shovels; tractors; Hilifts; Payloaders.

KAHULUI, MAUI, T. H.

CGPfi*—Pacific Chemical & Fertilizer Co.
P. O. Box 203; tel: Wailuku 33-5965. (Main ofc: Honolulu, Oahu.) G. F. Kerr, Branch Plant Mgr.; Roger Knox, Prod. Mgr. 20,000 tons. 1 mill, 25,000 tons. Conveyors & hopper system, etc.

PUHI, KAUAI, T. H.

CGPfi*—Pacific Chemical & Fertilizer Co.

P. O. Box 766 (Lihue, Kauai, T.H.); tel: (Lihue) 2-6571. (Main ofc: Honolulu, Oahu.) Douglas E. Baldwin, Prod. Mgr. 25,000 tons. 1 mill; conveyors & hopper system, etc.

PUERTO RICO

ARECIBO

C—Marques Comercial, Inc.
215 Santiago Inglesias Ave.; P. O. Box 668; tel: 119 & 189. Bernardo Marques, Pres., Plant Mgr. & Pur. Agt.; Jose Marques, V.P. & Treas.; Lelis Mera Vda. Marques, Exec. Sec.; Galo Taulet, Sub.-Sec. & Vice-Treas. 10,000 t. cap.; 1,000 t. stor. 1 mill, ½ ton; 1 hopper system.

CAGUAS

CPbm—Cipriano Manrique, Inc.
Ofc: Jimenez Sicardo No. 34; Plant: Padial St.; P. O. Box 548; tel: 469. Enrique Manrique, Pres.; Martin Manrique, V.P. Miguel A. Gonzalez, Treas. & Plant Mgr.; Fernando Manrique, Sec. 10,000 t. cap.; 2,500 t. stor. Bag conveyor; tractor shovel, bagging & sewing machines.

GUANICA

CaPbm—Ochoa Fertilizer Corp.
P. O. Box 117; tel: 27. (Main ofc: Hato Rey, P.R.) Samuel del Rosario, Plant Mgr. 60,000 tons. 1 mill.

HATO REY

AaPbm—Ochoa Fertilizer Corp.
Main office. P. O. Box 117; tel: 6-0220. Luis R. Gonzalez, Pres.; Manuel V. Gonzales, Exec. V.P.; Rafael M. Gonzalez, Isidoro A. Colon & Harold C. Haase, V.P.s.; Guillermo E. Gonzales, Sec.; Raul G. Mendez, Treas.; Manuel Espino, Supt. 100,000 tons. 2 mills, 50,000 t./yr. each. Plants also at: Guanica & Ponce, P. R.

MAYAGUEZ

CPm—Super-A Fertilizer Works, Inc.
250-254 McKinley St.; P. O. Box 599; tel: 678. Miguel A. Garcia Mendez, Pres.; Luis Rechani Agrait, V.P.; Armando Rovira, Treas. & Prod. Mgr.; Carlos Garcia Mendez, Sec. 25,000 t. cap.; 6000 t. stor. 1 mill.

PONCE

CHPfi—Ochoa Fertilizer Corp.
Comercio St.; P. O. Box 1606; tel: 354. (Main ofc: Hato Rey, P.R.) Jose A. Dueno, Plant Mgr. 35,000 tons.

SAN JUAN

C—Armour Fertilizer Works
(Main ofc: Atlanta, Ga., USA.) 411 Ochoa Bldg.; P. O. Box 3787; tel: 2-4503, 2-4504. A. W. Chandler, Div. Mgr.

CPm—San Miguel Fertilizer Corp.
P. O. Box 4391 (22); tel: 2-0130. Marcelino San Miguel, Pres.; Manuel San Miguel, V.P.; Jose A. Martinez Roman, V.P.; Luis de la Mata, V.P.—Sales; Guillermo Machargo, Treas.; Ana Maria Perez, Sec.; Carlos R. De Jesus, Prod. Mgr.; Jose M. Acosta, Supt. 80,000 tons. 2 Sturtevant batch mixers, 1 & 2 tons; 2 135-ft. 20-in. Link-Belt conveyors; 3 45ft. Link-Belt bucket elevators; 10 Hough Payloaders; hopper system.

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
s—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

CANADA

ALBERTA

CALGARY

CgO—Burns & Co., Ltd.

Head office. E. Calgary; tel: 5-3501. R. S. Munn, Pres. & Gen. Mgr.; J. Howard Kelly, Q. C., V.P. & Sec.; R. R. Furlong, V.P. in chg. Marketing; G. A. Knechtel, Treas.; B. Freeman, Gen. Plant Supt.; D. McLaren, Gen. Feeds & Fert. Mgr. 9,000 tons chem. fert. & 850 tons organic fert.; 1,000 t. stor. 6 mills, 1 4,000 & 5 1,000 t./yr.; mixers; belt conveyors; hopper systems. Plants also at: Edmonton, Alta.; Vancouver, B. C.; Winnipeg, Man.; Kitchener, Ont.; Prince Albert & Regina, Sask.

E—The Consolidated Mining & Smelting Co. of Canada, Ltd. Alberta Nitrogen Dept. Box 370; tel: 4-2186 (Main ofc: Trail, B. C.) 50,000 tons ammonia.

DELHI

C*—Ontario Plant Foods, Ltd.

G. A. Roe, Gen. Mgr. 15,000 tons.

EDMONTON

CO—Burns & Co., Ltd.

(Main ofc: Calgary, Alta.)

BRITISH COLUMBIA

KIMBERLEY

Eg—The Consolidated Mining & Smelting Co. of Canada, Ltd. Kimberley Fertilizer Dept. P. O. Box 2000. (Main ofc: Trail, B. C.) L. J. Nicholson, Supt. 70,000 t. cap.; 32,000 t. stor. Sulfuric & phosphoric acid, 11-48-0 ammonium phosphate.

NEW WESTMINSTER

BPb—Green Valley Fertilizer & Chemical Co., Ltd.

16th St. & 5th Ave.; P. O. Box 140; tel: 8185, 8186 & (Vancouver) DEter 7606. F. V. Lumb, Pres.; D. A. MacLachlan, Sales Mgr. & Mgr. Pest. Div.; G. E. Mendieta, Asst. Sec.; Jack Ordish, Plant Mgr. 20,000 t. cap.; 14,000 t. stor. 4 mills, rock grinding 2½ t./hr., fert. mixing 7 & 20 t./hr.; mineral mixing ½ t./hr.; hopper system for 20 t./hr. mixer; screw conveyor for bulk materials; belt conveyor for superphosphate bulking; Convey-Air blower system for fert. bulk storage; 4 elevators; 3 Payloaders; tractor, automatic scale.

SOUTH VANCOUVER

C*—Globe Fertilizer Co.

Compton Rd. John Aitken, Mgr. 4,000 tons.

TRAIL

AgE—The Consolidated Mining & Smelting Co. of Canada, Ltd.

Main oper. ofc. (Head ofc: Montreal, Que.) R. E. Stavert (Montreal, P. Q.), Pres.; R. W. Diamond, Exec. V.P.—Western Region; R. D. Perry, Gen. Mgr.; W. G. Jewett, Asst. Gen. Mgr. & Mgr. Mines; E. A. G. Colls, Mgr. Chemicals & Fert. Div.; A. L. Irwin, Mgr. Pur. Div.; Arthur W. Wikinson (Montreal, P. Q.) Mgr.

Fert. Sales Div.) 500,000 t. cap.; 200,000 t. stor. Mfg. Sulfuric & phosphoric acid; ammonia; ammonium phosphate; ammonium sulfate, ammonium nitrate; anhydrous ammonia; phosphoric & nitrate solutions; simple fertilizers. Plants also at: Calgary, Alta. & Kimberley, B. C.

S—Better Gardens, Ltd.

850 W. Hastings St. K. N. Andrews, Pres.; A. C. Andrews, Sec.-Treas. & Gen. Mgr. Complete equipment for tablet fertilizers.

VANCOUVER

C—Burns & Co., Ltd.

Foot of Woodland Dr.; tel: Hastings 0200. (Main ofc: Calgary, Alta.) I. M. McConnan, Plant Mgr.; H. Munro, Mgr. Fert. Div. 10,000 tons chemical mixes.

C—Vitalerth Products, Ltd.

1741 W. 4th Ave.; tel: CHerry 7330. Douglas M. Sutton Pres. 2,000 tons.

MANITOBA

WINNIPEG

CO—Burns & Co., Ltd.

(Main ofc: Calgary, Alta.)

NEW BRUNSWICK

EAST ST. JOHN

Cag—Canada Packers, Ltd.

Bayside Dr.; P. O. Box 159; tel: 2-4453. (Main ofc: Toronto, Ont.) J. K. Leggatt, Maritime Mgr.; S. G. Downing, Plant Mgr. 35,000 t. cap.; 20,000 t. stor. 2 mills, 25-30 t./hr.

ST. JOHN

CagPbm—International Fertilizers, Ltd.

Tel: 3-1239. (Main ofc: Quebec, Que.) L. J. Comeau, Supt.; J. L. Garey, Ofc. Mgr.; J. T. Driscoll, Maritime Sales Supvr. 60,000 tons. 1 Sturtevant mixing unit, 30 t./hr.; granulating unit with dryer, 10-15 t./hr.; 3 Sturtevant sacking units with Bates valve packers, 25 t./hr. each; Forano & Stephens-Adamson conveyors; Sturtevant & Stephens-Adamson elevators; locally constructed hoppers; HA, HL & HF Hough Payloaders; bag conveyor belts to cars; Towmotor lift trucks.

SAINT STEPHEN

Ce—The Summers Fertilizer Co., Inc.

P. O. Box 488; tel: 110. (Main ofc: Baltimore, Md., USA) W. E. Dresser, Plant Mgr.; J. E. Greenough, Asst. Mgr. 25,000 t. cap.; 20,000 t. stor. 2 mills, 40 t./hr.; hopper systems; conveyors; tractor shovels; etc.

NOVA SCOTIA

HALIFAX

C—Canadian Industries (1954) Ltd.

(Main ofc: Montreal, Que.) Fraser Ross, Dist. Sales Mgr.; A. B. Tolmie, Wks. Mgr. 25,000 tons.

PORT WILLIAMS

CaPm—Canada Packers, Ltd.

P. O. Box 130; tel: (Wolfville) 2231.

(Main ofc: Toronto, Ont.) Frank I. Balcom, Plant Mgr. 10,000 t. cap.; 10,000 t. stor. 1 mill; 1 ton mixer; 2 Hough tractors; Clark tractor.

WINDSOR

CD—Colonial Fertilizer Co., Ltd.

Nesbit St.; P. O. Box 50; tel: 176, 3403. L. E. Smith, Pres.; J. H. Downing, Treas.; W. E. Meekin, V.P.; Lewis Bearne, Mngng. Dir. Reuben E. Frank, Supt. & Pur. Agt. 30,000 t. cap.; 25,000 t. stor. 4 mills, 25 t./hr. each; 5 tractors; 4 belt conveyors; weighing hopper system.

SYDNEY

E—Dominion Steel & Coal Corp., Ltd.

Tel: 5471. (Main ofc: Montreal, Que.) C. M. Anson, Mgr. 8,000 tons. Sulphate of ammonia.

ONTARIO

CHATHAM

CagHPm—Canada Packers, Ltd.

Richmond Ext.; P. O. Box 241; tel: 4303. (Main ofc: Toronto, Ont.) James D. Browne, Mgr. 50,000 t. cap.; 25,000 t. stor. 2 mills; hopper systems; conveyors; tractor shovels.

C—Canadian Industries (1954) Ltd.

Box 270. (Main ofc: Montreal, Que.) D. S. Aitken, Dist. Sales Mgr.; Murray Smith, Wks. Mgr. 60,000 tons.

CORNWALL

CLP—Hy-Trous Co. of Canada, Ltd.

Frontenac Ave.; P. O. Box 1167; tel: 5600. E. J. Kaneb, Owner & Gen. Mgr. 10,000 t. cap.; 4,500 t. stor. 60 ton, 6 compartment batching hopper; 1-ton weigh hopper; complete conveyor system; 3 elevators; 2 Payloaders; 10 ton bagging hopper.

ELMIRA

BaPb—Read Brothers Fertilizers, Ltd.

Union St.; tel: 2553. John C. Read, Pres.; Howard B. Read, Sec.-Treas. & Plant Mgr. 15,000 t. cap.; 7,000 t. stor. 2 mills, 50 t./hr.; complete hopper system for continuous mixing; 1 ton tractor; 3 Payloaders.

GALT

OCPfm—Manchester Products

85 Ainslie St., S.; tel: 2137 I. K. Martin, Pres. (Sheep manure, bone meal, peat moss, pesticides.) 10,000 t. cap.; 500 t. stor.; hopper system; conveyors; tractor shovels.

HAMILTON

APf—Canadian Industries (1954) Ltd.

(Main ofc: Montreal, Que.) C. W. Jarvis, Asst. Dept. Sales Mgr.; H. G. Sewell, Dist. Sales Mgr.; H. M. Jones, Wks. Mgr. 140,000 tons superphosphate; 60,000 tons mixed fertilizer.

Hamilton By-Products Coke Ovens, Ltd.

82-84 King St., East. T. P. Pinckard, Gen. Mgr.; F. R. Palin, Sec.-Treas.; J. Campbell, Supt.; M. M. Brodie, Pur. Agt. 2,200 tons.

E—The Steel Co. of Canada, Ltd.

Wilcox St.; tel: JACkson 8-2511. E. A. Taylor, Sales Mgr., Coke & Coal-Chemicals Div.; J. W. Thomas,

A—Mfg. sulfuric or phosphoric acid, superphosphate and mixed fertilizers
B—Mfg. superphosphate and mixed fertilizers

C—Mfg. Mixed fertilizers
a—ammoniate
b—granulate
D—Also sell mixed goods made by another firm

E—Produce basic plant nutrient, materials or incomplete fertilizers
F—Offer dry spreader service
G—Sell liquid fertilizers made elsewhere

Supt. Coke Ovens. 18,000 t. cap.
ammonium sulfate; 1,800 t. stor.

INGERSOLL

Ca—William Stone Sons, Ltd.
Pemberton St.; tel. 20. F. H. Stone, Pres.; A. E. Izzard, V.P.; L. A. Westcott, Treas.-Sec.; R. A. Stone, Gen. Mgr. & Pur. Agt.; G. W. Pittock, Plant Supt.; M. A. Poole, Sales Mgr.; G. W. Lockhart, Ofc. Mgr. 50,000 tons. 2 mills, 20-25 t./hr.; Payloaders, belt conveyors; hopper system; fork lift trucks.

KITCHENER

O—Burns & Co. (Eastern) Ltd.
(Main ofc: Calgary, Alta.) L. N. Bradich, Provision Mgr. Meat meal & dry blood.

LONDON

LH—Na-Churs Plant Food Co. (Canada) Ltd.
2 Langarth St.; tel. 2-6738. Herbert Petrick (Marion, O., USA), Pres.; E. McLachlan, V.P. & Gen. Mgr. 500,000 gal.

NEW TORONTO

C—Swift & Co., Plant Food Div.
2194 Westfield Dr.; P. O. Box 39; tel. CLifford 9-3209. (Main ofc: Chicago, Ill., USA.) Glenn H. Johnson, Mgr.

NIAGARA FALLS

E—North American Cyanamid Co., Ltd.
(Head ofc: Toronto, Ont.; Gen. ofc: New York, N. Y., USA.)

NORWICH

CaF—Witts Fertilizer Works, Ltd.
Box 157; tel. 204. F. C. Bishop, Pres.; C. F. Bishop, V.P. & Pur. Agt.; J. C. Beattie, Sec.; G. F. Bishop, Treas.; J. W. Sinclair, Plant Mgr. 20,000 tons. 3 mills 25 t./hr. ea.; conveyor belts; hopper system for mixing; 2 complete bagging units; bulk shipping facilities; tractor shovels.

PORT DOVER

C—Misner Fertilizers, Ltd.
Tel: 1. J. H. Misner, Pres. & Mgr.; Oval W. Misner, V.P.; Ida A. Misner, Sec.-Treas. 7,000 t. cap.; 4,000 t. stor. Tractors; conveyors; etc.

PORT HOPE

C—Agricultural Chemicals, Ltd.
P. O. Box 250; tel. 2484. (Main ofc: New York, N. Y., USA.) M. J. Daignault, Mgr.; J. E. Morgan, Supt.

PORT ROBINSON

E—North American Cyanamid Co., Ltd.
Head ofc: Toronto, Ont.; Gen. ofc: New York, N. Y., USA) Calcium & ammonium nitrate.

SAULT STE. MARIE

E—Algoma Steel Corp., Ltd.
Tel: 3-3222. D. S. Holbrook, Exec. V.P.; H. G. MacAdam, Sec.; J. B. Barber, Comp.; W. E. Morley, Treas.; W. E. Knudsen, Pur. Agt.; C. C. Weeks, Mgr. of Sales; L. H. Derrer, Steel Wks. Gen. Mgr. 15,000 t. cap. ammonium sulfate; 2,000 t. stor.

THAMESVILLE

CHPm—United Cooperatives of Ontario
Box 408; tel. 129. (Main ofc. W. Toronto, Ont.) Ed Martin, Supt. 15,000 t. cap.; 4,000 t. stor. 1 mill, 30 t./hr.; hopper system; conveyor; 1-ton Ransome mixer; St. Regis bagging equipment; Payloaders; lift truck.

TORONTO

Canada Packers, Ltd.—Fertilizer & Feed Div.
Head office: 2200 St. Clair Ave., W. (9); tel. Roger 6-4311. W. F. McLean, Pres.; George A. Schell, Exec. V.P.; T. J. Payne, Fert. & Feed Div. Mgr.; Alex. Mooney, Fert. & Feed Div. Sales Mgr.; Willis A. Buie, Gen. Supt. Brock, Pur. Agt. Plants: Chatham, Welland & West Toronto, Ont.; Montreal & Ste. Foy, Que.; East St. John, N. B.; Summerside, P. E. I.; Port Williams, N. S.; Presque Isle, Me., USA.

North American Cyanamid Co., Ltd.
Head office. (General ofc. New York, N. Y., USA) 2004 Royal Bank Bldg. (1); tel. EMpire 6-8807; A. T. Sinclair, Sales Mgr. Plants at: Niagara Falls & Port Robinson, Ont.

WELLAND

CaPm—Canada Packers, Ltd.
Tel: 5563. (Main ofc: Toronto, Ont.) W. P. Gillespie, Supt. 18,000 t. cap.; 12,000 t. stor. 1 mill, 30 t./hr.; tractor shovels; fork lift trucks.

WEST TORONTO

CagPm—Canada Packers, Ltd.
(Main ofc: Toronto, Ont.) Willis Buie, Gen. Supt. 55,000 t. cap.; 30,000 t. stor. 4 mills, 25-30 t./hr.; complete belt conveyor system; tractor shovels; fork lift trucks; electric worksavers.

CPBfm—United Cooperatives of Ontario

Agricultural Chemical Dept. 4004 Dundas St., W. (9); tel. ROger 7-8448. Earl M. Grose, Mgr.; Don Moffatt, Asst. Mgr. Sam Rankin, Supt. 12,000 t. cap.; 4,000 t. stor. 1 mill, 20 t./hr.; 2 Payloaders; conveyor; hopper; lift trucks; 1-ton Ransome mixer; St. Regis bagging equipment. Plant also at Thamesville, Ont.

PRINCE EDWARD ISLAND

CHARLOTTETOWN

Ca—Island Fertilizers, Inc.
P. O. Box 361; tel. 5597. Austin A. Scales, Pres.; Louis Sadler, Sec.-Treas. & Plant Mgr. 25,000 t. cap.; 40,000 t. stor. 2 mills, 30 & 50 t./hr.; 1 Sturdevant mixing & shipping unit; 1 Sturdevant shipping unit; Lorain power shovel for stockpiling & reclaiming; Hough Payloaders.

SUMMERSIDE

CaPbm—Canada Packers, Ltd.
17 South St.; tel. 2211, 2212. (Main ofc: Toronto, Ont.) G. S. Cooke, Plant Mgr. 18,000 t. cap.; 15,000 t. stor. 2 mills, 30 t./hr. mixing; complete conveyor system; 2 Payloaders; fork lift.

QUEBEC

BELOEIL

B—Canadian Industries (1954) Ltd.
(Main ofc: Montreal, Que.) J. M. Bromley, Wks. Mgr. 140,000 tons superphosphate, 50,000 tons mixed fertilizer.

FORT CHAMBLEY

C—Agricultural Chemicals, Ltd.
Tel: 21. (Main ofc: New York, N. Y., USA.) M. J. Daignault, Mgr.; Albert LeGault, Supt.

LA. PRAIRIE

CaPbE—William Houde, Ltd.
P. O. Box 130; tel. 0 9-0751. William Houde, Pres. & Co-Mgr.; Roland Oliver, Co-Mgr.; S. J. Chagnon, V.P.; J. A. Leclerc, Sec. 30,000 t. cap.; 15,000 t. stor. 2 mills, 10,000 & 20,000 t./yr.; dual elevator system; scale hopper; belt conveyors to bins. Compagnie Nord Africaine de L'Hyperphosphate Reno, formerly at 1504 Mountain St., Montreal, now amalgamated with above firm and located at La Prairie; both firms to be operated jointly, producing hyperphosphate (natural North African phosphate pulverized to 300 mesh.)

MONTREAL

Ca—Canada Packers, Ltd.
6000 St. Patrick St.; tel. Glenview 2881. (Main ofc: Toronto, Ont.) Delbert Dupre, Mgr.; A. Fredette, Supt. 50,000 t. cap.; 30,000 t. stor.

C—Canadian Industries (1954) Ltd.—Agricultural Chemicals Dept.

Head office. P. O. Box 10. V. B. Lillie, Dept. Mgr.; J. W. Thompson, Sales Mgr.; L. V. Clegg, Prod. Mgr. Plants at: Halifax, N. S.; Beloeil & Montreal, Que.; Hamilton & Chatham, Ont. Montreal Works: H. H. Skelton, Dist. Sales Mgr.; S. Cree, Wks. Mgr. 15,000 tons.

The Consolidated Mining & Smelting Co. of Canada, Ltd.

Head office. 215 St. James St., W.; P. O. Box 1030, Place d'Armes (1); tel. Avenue 8-3103. (Main ofc. for oper.; Trail, B. C.) R. E. Stalvert, Pres.; L. O. Reid, Sec.; A. Wilkinson, Mgr. Chem. & Fert. Sales Div.

Dominion Steel & Coal Corp., Ltd.

Head office. Canada Cement Bldg., Phillips Square. T. H. McEvoy, V.P., Steel Sales. Plant at Sydney, N. S.

E—Montreal Coke & Manufacturing Co.

435 St. Patrick St.; P. O. Box 600; tel. GL 6341. C. A. Tellman, Pres. & Mng. Dir.; R. Latreille, V.P.; H. A. B. Stufmann, Sec.-Treas.; J. G. Dowker, Pur. Agt.; L. T. Calhoun, Plant Mgr.; G. C. Jarvis, Sales Mgr.; W. R. Carmichael, Supt. 5,000 N. T. ammonium sulphate.

QUEBEC

CaPbm—International Fertilizers, Ltd.

Ofc: 71 St. Peter St.; Plant: Wolf's Cove, Sillery; P. O. Box 609; tel. 2-3858. T. S. L. Pope, Pres.; A. Lambert, Gen. Mgr.; C. A. Lepage, Sales Mgr.; J. P. McHaffie, Prod. Mgr.; L. A. Hanson, Plant Supt.; L. E.

H—Offer liquid applicator service
L—Mix complete liquid fertilizers
O—Process organic materials
P—Sell pesticides

b—buy from outside source
f—formulate
m—mix with fertilizers
S—Mfg. specialty or shelf goods

*—Current information not received in time for publication
—No key indicates main or divisional office, no plant at this location

Whitworth, Mgr. Pest. Div. 40,000 tons. Sturtevant mixing unit, 30 t./hr.; 1 granulating unit with dryer, 10-15 t./hr.; 2 Sturtevant sacking units with Bates valve packers, 27 t./hr. ea.; Forano & Stephens-Adamson conveyors; Sturtevant & Stephens-Adamson elevators, locally constructed hoppers; HA, HL & HF Hough Payloaders; bag conveyor belts to cars & Towmotor lift trucks for truck shipments. Plant also at: St. John, N. B. Total capacity 100,000 t.; total storage 65,000 t.

STE. FOY

Ca—Canada Packers, Ltd.

(Main ofc: Toronto, Ont.) Delbert Dupre, R. R. 1, Quebec Sillery; tel: (Quebec) 7-3418. Delbert Dupre, Quebec Mgr.; Donald M. Smythe, Asst. Quebec Mgr.; Roland Dansereau, Local Supt. 20,000 t. cap.; 15,000 t. stor. 1 mill, 2 tons; batch hopper; scale hoppers; belt conveyors; Payloaders.

SASKATCHEWAN

PRINCE ALBERT

O—Burns & Co., Ltd.

(Main ofc: Calgary, Alta.) I. McCannan, Mgr.; E. Crowston, Prod. Mgr. 800 tons organic fertilizer.

REGINA

CO—Burns & Co., Ltd.

Winnipeg & 9th; tel: 5877. (Main ofc: Calgary, Alta.) Harvey Grant, Plant Mgr. 1 mill, 1 ton. Mfg. mixed fert., bone meal, tankage.

CUBA

HAVANA

C—The American Agricultural Chemical Co.

Reina Y Amistad, Palacio Aldama, 2do. Piso; tel: A-1196. (Main ofc: New York, N. Y., USA) Philip B. Arms, Mgr.; A. Costales, Jr., Supt.

Armour & Co., S. A.—Fertilizer Dept.

Desamparados 166. (Main ofc: Armour Fertilizer Works, Atlanta, Ga., USA) O. J. Fischer, Mgr. Plant at Matanzas.

Ca—Cooperativa Abonos Cuba, S. A.

Noriega No. 12, Luyano; tel: X-1483. Gabino Otero, Pres.; Carlos Maldonado, V.P.; Emilio Diaz, V.P. & Co-Mgr. Epifanio Arce, Treas. & Co-Mgr.; Dr. Antonio Avila, Sec. 50,000 t. cap.; 8,000 t. stor. 1 mill, 1 ton; Hough Payloader; 3 portable conveyors; 2 piling machines.

CaPfi—Pereda Fernandez Y Cia.,

Importadores y Exportadores, S. A.

Iola, Villanueva y Aspuru; P. O. Box 414 tel: X-3311, X-3312, X-3313. Jesus Fernandez, Pres.; Ramon Llama, V.P., Plant Mgr. & Mgr. Pesticide Div.; Jose Gomez, Treas.; Dr. Pedro A. Villoldo, Sec. 18,000 t. cap.; 10,000 t. stor. 1 screen mill; 1 mixer, 1 ton; vibrating screen; 2 elevators; 2 conveyor belts; 2 Payloaders; 1 hopper system; 1 man batch weight system; 2 baggers & scales; 2 sewing machines.

Ca—Perez Galan y Fernandez, S. L.

Ofc: Lonja Comercio 425; Plant: Avenida 10 de Octubre y Camino

Embil, Regla; P. O. Box 209; tel: M-3772, A-4638. Manuel Perez Galan, Gen. Dir.; Angelberto Fernandez Ferrer, Exec.; Agustin Meizoro, Plant Mgr.; Joaquin Fernandez Ferrer, Prod. & Pur Mgr. 12,500 t. cap.; 4,500 t. stor. Hopper systems; conveyors; Payloaders.

Aa—Productora de Superfosfatos, S. A.

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Ca—Zaldo y Martinez, S. A.

Zanja No. 721 esquina a Hospital; P. O. Box 769; tel: VO-9336 & 9337 & 9338. Fernando Martinez Zaldo, Pres.; Aquiles Martinez, Ernesto de Zaldo, & Antonio C. Fraga, V.P.'s; Jose A. Fernandez, Plant Mgr. 27,000 tons.

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Products and Services Directory

This directory is divided into four sections: Equipment (page 169), Materials (page 179), Services (page 187), and Supplies (page 189), with pertinent sub-classifications in each section. Following is a Buyers Guide, beginning on page 190, giving complete addresses and information about firms offering these products and services.

EQUIPMENT

Acid Pumps

(See Pumps)

Acidulators, Batch

Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
Fertilizer Equipment Sales Co.
Stedman Foundry & Machine
Sturtevant Mill Co.
The D. M. Weatherly Co.

Acidulators, Continuous

Atlanta Utility Works
Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
Fertilizer Equipment Sales Co.
The A. J. Sackett & Sons Co.
The D. M. Weatherly Co.

Aerators

Fertilizer Engineering & Equip. Co.
The Jeffrey Manufacturing Co.

Agitators, Liquid Mixing

Acme-Fisher Division
Fertilizer Engineering & Equip. Co.

Air Compressors

(See Compressors)

Air Separators

(See Separators)

Ammoniator-Granulators, Continuous

Edw. Renneburg & Sons Co.

Ammoniators, Batch

Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
Fertilizer Equipment Sales Co.
Sturtevant Mill Co.
The D. M. Weatherly Co.
Worthington Corp.

Ammoniators, Continuous

Atlanta Utility Works
Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
Fertilizer Equipment Sales Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.
Stedman Foundry & Machine Co.
Sturtevant Mill Co.
The D. M. Weatherly Co.
Worthington Corp.

Applicators, Liquid Nitrogen

General Metals, Inc.

Applicators, Liquid Plant Food

Acme-Fisher Division
General Metals, Inc.
Schelm Brothers, Inc.

Assembly Hoppers

(See Hoppers)

Babbitt Metals

National Lead Co.
The A. J. Sackett & Sons Co.

Bag Closing Machinery

Fertilizer Engineering & Equip. Co.
The A. J. Sackett & Sons Co.

Bag Holders

Atlanta Utility Works
Baldwin Foundry & Machine Corp.
Fertilizer Engineering & Equip. Co.
The A. J. Sackett & Sons Co.
Stedman Foundry & Machinery Co.

Bag Printers

Industrial Marking Equipment Co.

Basing Units, Complete

Atlanta Utility Works
Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
Fertilizer Equipment Sales Co.
The A. J. Sackett & Sons Co.
Sturtevant Mill Co.
The D. M. Weatherly Co.

Bearings

Baldwin Foundry & Machine Corp.
Fertilizer Engineering & Equip. Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.
The A. J. Sackett & Sons Co.

Belting, Conveyor

Atlanta Utility Works
Davidson Kennedy Co.
Continental Gin Co.
Fertilizer Engineering & Equip. Co.
Fertilizer Equipment Sales Co.
Link-Belt Co.
The A. J. Sackett & Sons Co.

Belting, Power Transmission

Continental Gin Co.
Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
Link-Belt Co.

Bowls, Pulverized Fuel

Combustion Engineering, Inc.

Breakers, Boot

Atlanta Utility Works

Breakers, Foot

Davidson Kennedy Co.
Delta Manufacturing Co.
Fertilizer Engineering & Equip. Co.
Fertilizer Equipment Sales Co.
The A. J. Sackett & Sons Co.

Breakers, Head

Atlanta Utility Works
Davidson Kennedy Co.
Delta Manufacturing Co.
Fertilizer Engineering & Equip. Co.
Fertilizer Equipment Sales Co.
The A. J. Sackett & Sons Co.

Buckets, Clamshell

Fertilizer Engineering & Equip. Co.

Buckets, Elevator

Atlanta Utility Works
Continental Gin Co.
Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.
Stedman Foundry & Machine Co.
Sturtevant Mill Co.
The D. M. Weatherly Co.

Burning Bar

National Lead Co.

Cars, Materials Handling

Fertilizer Engineering & Equip. Co.

Carts

Atlanta Utility Works
Fertilizer Engineering & Equip. Co.

Case Numbering Machinery

Industrial Marking Equipment Co.

Castings, Chemical

Stedman Foundry & Machine Co.

Casings, Elevator

Atlanta Utility Works
Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
Fertilizer Equipment Sales Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.
Stedman Foundry & Machine Co.
Sturtevant Mill Co.

Castings, Gray Iron

Stedman Foundry & Machine Co.

Castings

Davidson Kennedy Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.

Chain, Belts

Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
Link-Belt Co.
The A. J. Sackett & Sons Co.

Chains, Conveyor

Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.
The A. J. Sackett & Sons Co.

Chains, Elevator

Atlanta Utility Works
Continental Gin Co.

Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.
The A. J. Sackett & Sons Co.

Chutes

Atlanta Utility Works
Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.
Sturtevant Mill Co.

Clutches, Friction

Link-Belt Co.

Clutches

Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
The Jeffrey Manufacturing Co.
The A. J. Sackett & Sons Co.

Coding & Dating Equipment

Industrial Marking Equipment Co.

Colls, Lead

Acme-Fisher Division
Evans Metal Co.
Fertilizer Engineering & Equip. Co.
Southern Lead Burning Co.

Collectors, Dust

Acme-Fisher Division
Chemical Construction Corp.
Fertilizer Engineering & Equip. Co.
Fertilizer Equipment Sales Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.
Southern Steel Equipment Co.
The D. M. Weatherly Co.

Coolers, Vertical

The A. J. Sackett & Sons Co.

Compressors, Air

Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
General Metals, Inc.

The A. J. Sackett & Sons Co.
Schelm Brothers, Inc.

Controls, Bin Level

Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.
The A. J. Sackett & Sons Co.

Controls, Flow

Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
Fertilizer Equipment Sales Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.

Controls, Motor

Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
The A. J. Sackett & Sons Co.

Controls, Speed

Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
Link-Belt Co.
The A. J. Sackett & Sons Co.

Conveyors, Apron

Continental Gin Co.
Davidson Kennedy Co.
Fertilizer Equipment Sales Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.
The A. J. Sackett & Sons Co.

Conveyors, Belt

Atlanta Utility Works
Continental Gin Co.
Davidson Kennedy Co.
Fertilizer Equipment Sales Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.
Southern Steel Equipment Co.
Sturtevant Mill Co.

Conveyors, Bucket

Continental Gin Co.

Davidson Kennedy Co.
Delta Manufacturing Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.
Sturtevant Mill Co.

Conveyors, Chain

Continental Gin Co.
Davidson Kennedy Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.

Conveyors, Flexible

Davidson Kennedy Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.

Conveyors, Flight

Continental Gin Co.
Davidson Kennedy Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.
Sturtevant Mill Co.

Conveyors, Oscillating

Link-Belt Co.

Conveyors, Pneumatic

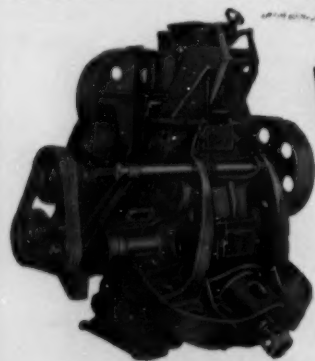
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Edw. Renneburg & Sons Co.

Conveyors, Portable

Atlanta Utility Works
Davidson Kennedy Co.
Fertilizer Equipment Sales Co.
The A. J. Sackett & Sons Co.

Conveyors, Screw

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The Jeffrey Manufacturing Co.
Link-Belt Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.
Sturtevant Mill Co.



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Link-Belt Co.
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Conveyors, Weighing

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The Jeffrey Manufacturing Co.
Link-Belt Co.
The A. J. Sackett & Sons Co.
Thayer Scale & Engineering Corp.

Coolers, Lead

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Coolers, Rotary

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Hyster Co.

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Southern Lead Burning Co.

Distillation Units, Fatty Acid

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Link-Belt Co.
The A. J. Sackett & Sons Co.

Drives, Chain

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Fertilizer Engineering & Equip. Co.

The Jeffrey Manufacturing Co.

Link-Belt Co.

The A. J. Sackett & Sons Co.

Drives, Fluid

Fertilizer Engineering & Equip. Co.
Link-Belt Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.

Drives, Gear

Atlanta Utility Works
Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
Link-Belt Co.
The A. J. Sackett & Sons Co.

Drives, Variable Speed

Link-Belt Co.

Dryers, Flash

Combustion Engineering, Inc.
Fertilizer Engineering & Equip. Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.

Dryers, Rotary—Gas-Fired

R. D. Cole Mfg. Co.
Combustion Engineering, Inc.
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Delta Manufacturing Co.
Fertilizer Engineering & Equip. Co.
General American Transport. Corp.
Link-Belt Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.
Sturtevant Mill Co.
The D. M. Weatherly Co.

Dryers, Rotary—Oil-fired

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Davidson Kennedy Co.
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The A. J. Sackett & Sons Co.
Sturtevant Mill Co.
The D. M. Weatherly Co.

Ducts

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Fertilizer Equipment Sales Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.
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Dumpers, Truck (Hydraulic)

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Elevators, Belt

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Fertilizer Equipment Sales Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.
The A. J. Sackett & Sons Co.
Sturtevant Mill Co.

Elevators, Bucket

Atlanta Utility Works
Continental Gin Co.
Davidson Kennedy Co.
Delta Manufacturing Co.
Fertilizer Engineering & Equip. Co.
Fertilizer Equipment Sales Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.
Stedman Foundry Machine Co., Inc.
Sturtevant Mill Co.
The D. M. Weatherly Co.

Elevators, Portable

Atlanta Utility Works
Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
Fertilizer Equipment Sales Co.

Elevators, Screw

Continental Gin Co.
Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
Fertilizer Equipment Sales Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.

Excavators

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Fans, Exhaust

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Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.

Feeders, Rotary

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Fertilizer Engineering & Equip. Co.
Link-Belt Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.
Sturtevant Mill Co.
Thayer Scale & Engineering Corp.

Feeders, Screw

Continental Gin Co.
Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
Fertilizer Equipment Sales Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.

Feeders, Table

Fertilizer Engineering & Equip. Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.

Feeders, Vibrating

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The Jeffrey Manufacturing Co.
Link-Belt Co.
The A. J. Sackett & Sons Co.
Thayer Scale & Engineering Corp.

Filters

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Foundries

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Link-Belt Co.

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The A. J. Sackett & Sons Co.

Gears

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Gauges, Tank

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Hoists, Hand

Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.

Hoists, Power

Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
Hyster Co.

Hoists, Skip

Link-Belt Co.

Hoppers, Batching

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Davidson Kennedy Co.
Delta Manufacturing Co.
Fertilizer Engineering & Equip. Co.
Fertilizer Equipment Sales Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.
Southern Steel Equipment Co.
Stedman Foundry Machine Co., Inc.
Sturtevant Mill Co.
Thayer Scale & Engineering Corp.
The D. M. Weatherly Co.

Hoppers, Cluster

Atlanta Utility Works
Davidson Kennedy Co.

Delta Manufacturing Co.

Fertilizer Engineering & Equip. Co.
Fertilizer Equipment Sales Co.
The A. J. Sackett & Sons Co.
Southern Steel Equipment Co.
Sturtevant Mill Co.
The D. M. Weatherly Co.

Hoppers, Multiple

Atlanta Utility Works
Davidson Kennedy Co.
Delta Manufacturing Co.
Fertilizer Engineering & Equip. Co.
Fertilizer Equipment Sales Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.
Southern Steel Equipment Co.
Sturtevant Mill Co.
The D. M. Weatherly Co.

Hoppers, Track

Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.
The A. J. Sackett & Sons Co.

Idlers, Belt Conveyor

Atlanta Utility Works
Continental Gin Co.
Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.
Fertilizer Equipment Sales Co.
The Jeffrey Manufacturing Co.
Link-Belt Co.
The A. J. Sackett & Sons Co.

Indicators

Davidson Kennedy Co.
Fertilizer Engineering & Equip. Co.

Laboratory Equipment

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Fertilizer Engineering & Equip. Co.
Sturtevant Mill Co.

Lead Burning

Southern Lead Burning Co.

Lead Fabrication

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Lead, Hard

National Lead Co.

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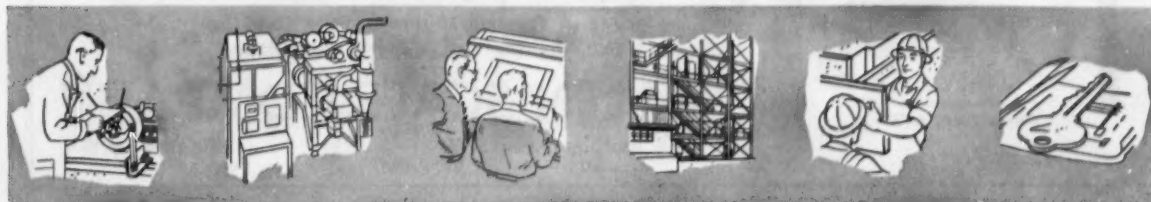
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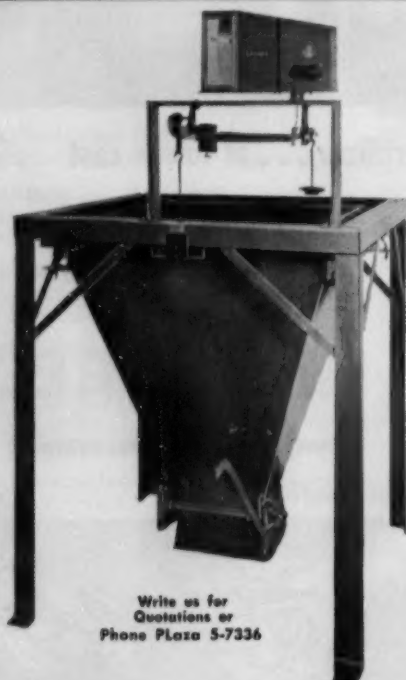
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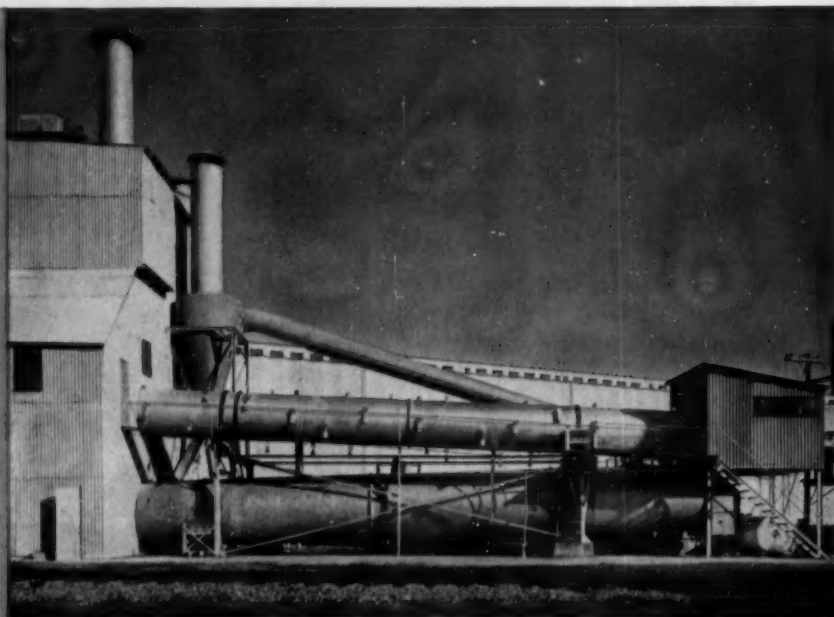
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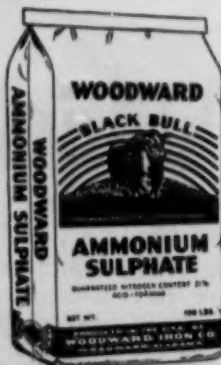
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Atkins, Kroll & Co.
Woodward & Dickerson, Inc.

Conditioners, Soil—Mineral
Zonolite Co.**Conditioners, Soil—Organic**

Ashcraft-Wilkinson Co.
Atkins, Kroll & Co.
Woodward & Dickerson, Inc.

Copper, Neutral

U. S. Phosphoric Products Div.

Copper Carbonate

Tennessee Corp.

Copper Oxide

Calumet Division
Tennessee Corp.

Copper Sulfate

Tennessee Corp.
U. S. Phosphoric Products Div.
Woodward & Dickerson, Inc.
Woolfolk Chemical Works, Ltd.

Copper Sulfate—Basic

Woodward & Dickerson, Inc.

CALUMET BROWN COPPER OXIDE

FUNGICIDE GRADE—75% Cu—Calumet Brown Copper Oxide offers effective low-cost control of the principal plant diseases on major crops, such as potatoes, tomatoes, citrus, celery, cucumbers, cantaloupe, watermelon, etc.

As a spray or dust this material can be used with maximum safety in supplying nutritional copper for the treatment of soil deficiencies in corrective or maintenance programs.

FERTILIZER GRADE—50% Cu (62.5% CuO) or 80% Cu (100% CuO)—Calumet Brown Copper Oxide is the ideal form of copper for use as a trace element or secondary plant food. Experiment Station results have proven this relatively insoluble form of copper to be readily available to plants. Containing no free or chemically combined water it does not contribute to caking in mixed fertilizers.

Its low cost and high degree of concentration makes this especially attractive to fertilizer manufacturers.

MINERAL FEED GRADE—50% or 80% Cu—Calumet Brown Copper Oxide has been proven an excellent source of copper in mineralized feed mixtures. This form of copper is compatible with other feed constituents, with minimum adverse effect on their chemical stability.

LOW COSTS—Calumet Brown Copper Oxide, manufactured by a unique process, is essentially a low-cost material. Our agricultural specialists will be glad to show you how attractive cost savings can be made by utilizing Calumet Brown Copper Oxide in your formulations.

THE BROWN COPPER FOR BETTER CROPS

CALUMET DIVISION

of CALUMET & HECLA, INC.

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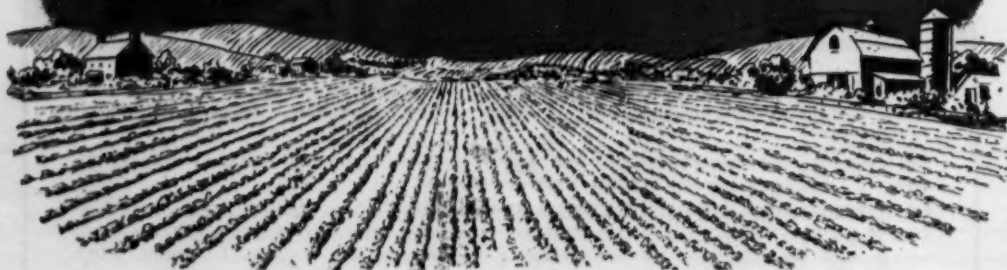
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Copper Sulfate—Tribasic

Tennessee Corp.
U. S. Phosphoric Products Div.
Woolfolk Chemical Works, Ltd.

Cotton Bur Ash, Ground

Ashcraft-Wilkinson Co.
Alex M. McIver & Son

Cottonseed Products

Ashcraft-Wilkinson Co.
Atkins, Kroll & Co.
Woodward & Dickerson, Inc.

Cracklings

Ashcraft-Wilkinson Co.
Woodward & Dickerson, Inc.

Cyanamid

American Cyanamid Co.
Armour Fertilizer Works
Woodward & Dickerson, Inc.

Defoliant

American Cyanamid Co.
Pacific Coast Borax Co.

Diammonium Phosphate

Atkins, Kroll & Co.
Alex M. McIver & Son
Monsanto Chemical Co.
Woodward & Dickerson, Inc.

Diatomaceous Earth

Ashcraft-Wilkinson Co.
Johns-Manville Corp.

Dicalcium Phosphate

The American Agricultural Chemical Co.
Bradley & Baker
Monsanto Chemical Co.
Woodward & Dickerson, Inc.

Diluents

The American Agricultural Chemical Co.
Ashcraft-Wilkinson Co.
Johns-Manville Corp.
Minco Products Corp.
Zonolite Co.

Disodium Phosphate

The American Agricultural Chemical Co.
Monsanto Chemical Co.

Dolomite

Ashcraft-Wilkinson Co.
Alex M. McIver & Son
Marble Products Co. of Ga.

Feed Products

Ashcraft-Wilkinson Co.
Atkins, Kroll & Co.
Bradley & Baker
International Ore & Fertilizer Corp.
Samuel D. Keim
Nitrogen Div. Allied Chem. & Dye
Woodward & Dickerson, Inc.

Ferric Iron Sulfate

Atkins, Kroll & Co.
Tennessee Corp.
U. S. Phosphoric Products Div.

Fertilizer Compounds

Ashcraft-Wilkinson Co.
Atkins, Kroll & Co.
International Minerals & Chemical
Alex M. McIver & Son
Samuel D. Keim
Wilson & Toomer Fertilizer Co.
Woodward & Dickerson, Inc.

Fertilizer Materials, Nitrogen

American Cyanamid Co.
Ashcraft-Wilkinson Co.
Atkins, Kroll & Co.
H. J. Baker & Bro.
Bradley & Baker
Grand River Chemical Div.
International Minerals & Chemical
International Ore & Fertilizer Corp.
Samuel D. Keim
Lion Oil Co.
Alex M. McIver & Son
Nitrogen Products, Inc.
Northern Chemical Industries, Inc.
Phillips Chemical Co.
F. S. Royster Guano Co.
Smith-Rowland Co.
Sohio Chemical Co.
Summers Fertilizer Co., Inc.
Synthetic Nitrogen Products Corp.
United Fertilizer Co.
United States Steel Corp.
Wilson & Toomer Fertilizer Co.
Woodward & Dickerson, Inc.

Fertilizer Materials, Phosphate

The American Agricultural Chemical Co.
American Cyanamid Co.
Armour Fertilizer Works
Ashcraft-Wilkinson Co.
Atkins, Kroll & Co.
Davison Chemical Co.
International Minerals & Chemical
Samuel D. Keim
Alex M. McIver & Sons
Monsanto Chemical Co.
Northern Chemical Industries, Inc.
Planters Fertilizer & Phosphate Co.
F. S. Royster Guano Co.
Summers Fertilizer Co., Inc.
Wilson & Toomer Fertilizer Co.
Woodward & Dickerson, Inc.

Fertilizer Materials, Potash

American Potash & Chemical Corp.
Ashcraft-Wilkinson Co.
Bradley & Baker
International Minerals & Chemical
Samuel D. Keim
Alex M. McIver & Sons
Potash Import & Chemical Corp.
Southwest Potash Corp.
Woodward & Dickerson, Inc.

Fertilizer Materials, Trace Elements

Calumet Division
Pacific Coast Borax Co.
Tennessee Corp.

Fertilizers, Complete

The American Agricultural Chemical Co.
Armour Fertilizer Works
Davison Chemical Co.
International Minerals & Chemical Corp.
Nitrogen Div. Allied Chem. & Dye
Robertson Chemical Corp.
F. S. Royster Guano Co.
Southern States Phos. & Fert. Co.
Summers Fertilizer Co., Inc.
Wilson & Toomer Fertilizer Co.
Woodward & Dickerson, Inc.

Fertilizers, Liquid

American Cyanamid Co.
Lion Oil Co.
Nitrogen Products, Inc.

Fertilizers, Mixed

The American Agricultural Chemical Co.
Armour Fertilizer Works
Davison Chemical Co.
International Minerals & Chemical
International Ore & Fertilizer Corp.
Nitrogen Div. Allied Chem. & Dye
Planters Fertilizer & Phosphate Co.
F. S. Royster Guano Co.
Southern States Phos. & Fert. Co.
Summers Fertilizer Co., Inc.
Wilson & Toomer Fertilizer Co.
Woodward & Dickerson, Inc.

Fertilizers, Mixed—Granular

Armour Fertilizer Works
Davison Chemical Co.
International Minerals & Chemical
Nitrogen Div. Allied Chem. & Dye
Robertson Chemical Corp.
Summers Fertilizer Co., Inc.
Woodward & Dickerson, Inc.

Fertilizers, Soluble

Davison Chemical Co.
International Minerals & Chemical
Woodward & Dickerson, Inc.

Fish Meal & Scrap

Ashcraft-Wilkinson Co.
Atkins, Kroll & Co.
H. J. Baker & Bro.
Alex M. McIver & Sons
Summers Fertilizer Co., Inc.
Woodward & Dickerson, Inc.

Fuller's Earth

Ashcraft-Wilkinson Co.

Fumigants

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Woolfolk Chemical Works, Ltd.

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Woolfolk Chemical Works, Ltd.

Gelatin

The American Agricultural Chemical Co.

Granulating Bond

(See Bond, Granulating)

Growth Inhibitors

American Cyanamid Co.

Herbicides, Formulations

American Cyanamid Co.
Pacific Coast Borax Co.
Woolfolk Chemical Works, Ltd.

Herbicides, Technical

American Cyanamid Co.
Lion Oil Co.

Inhibitors, Plant Growth

(See Growth Inhibitors)

Insecticides, Concentrates

Commercial Solvents Corp.
Mackwin Co.
Woodward & Dickerson, Inc.
Woolfolk Chemical Works, Ltd.

Insecticides, Formulations

Commercial Solvents Corp.
Davison Chemical Co.
Mackwin Co.
Summers Fertilizer Co., Inc.
Wilson & Toomer Fertilizer Co.
Woodward & Dickerson, Inc.
Woolfolk Chemical Works, Ltd.

Insecticides, Granular

Woodward & Dickerson, Inc.
Woolfolk Chemical Works, Ltd.

Insecticides, Packaged

The American Agricultural Chemical Co.
Davison Chemical Co.
Summers Fertilizer Co., Inc.

Insecticides, Technical

American Cyanamid Co.
Commercial Solvents Corp.
Davison Chemical Co.
Mackwin Co.
Woodard & Dickerson, Inc.

Iron Sulfate

Atkins, Kroll & Co.
Alex M. McIver & Sons
Woolfolk Chemical Works, Ltd.

Kaolin

Ashcraft-Wilkinson Co.

Lead Arsenate

The American Agricultural Chemical Co.

Woodward & Dickerson, Inc.
Woolfolk Chemical Works, Ltd.

Leather Meal

Ashcraft-Wilkinson Co.
Atkins, Kroll & Co.
Alex M. McIver & Sons
Woodward & Dickerson, Inc.

Lime, Agricultural

American Cyanamid Co.
Armour Fertilizer Works
Ashcraft-Wilkinson Co.
Consolidated Chemical Industries
Alex M. McIver & Sons
Woolfolk Chemical Works, Ltd.

Lime, Burned

Ashcraft-Wilkinson Co.
Consolidated Chemical Industries

Lime, Hydrated

Ashcraft-Wilkinson Co.
Consolidated Chemical Industries
Woolfolk Chemical Works, Ltd.

Lime Nitrogen

Atkins, Kroll & Co.

Lime Sulfur

Woolfolk Chemical Works, Ltd.

Limestone

American Limestone Co.
Marble Products Co. of Ga.
Willingham-Little Stone Co.

Limestone, Agricultural

American Limestone Co.
Marble Products Co. of Ga.

Limestone, Dolomitic

American Limestone Co.
Marble Products Co. of Ga.
Willingham-Little Stone Co.

Liver Meal

Ashcraft-Wilkinson Co.
Atkins, Kroll & Co.
Woodward & Dickerson, Inc.

Magnesia, Agricultural

Woodward & Dickerson, Inc.

Manganese Ore

Woodward & Dickerson, Inc.

Manganese Sulfate

Tennessee Corp.
U. S. Phosphoric Products Div.
Woodward & Dickerson, Inc.

Manganous Oxide

Tennessee Corp.

U. S. Phosphoric Products Div.

Manure, Dried

Armour Fertilizer Works
Ashcraft-Wilkinson Co.
H. J. Baker & Bro.
Summers Fertilizer Co., Inc.

Manure, Natural

H. J. Baker & Bro.

Mineral Mixtures

Tennessee Corp.

Mineral Salts

Tennessee Corp.

Mono-Ammonium Phosphate

Alex M. McIver & Sons

Muriatic Acid

Consolidated Chemical Industries

Nitrate of Soda-Potash

Armour Fertilizer Works
Woodward & Dickerson, Inc.

Nitric Acid

Consolidated Chemical Industries
Lion Oil Co.
Northern Chemical Industries, Inc.
Sohio Chemical Co.
Spencer Chemical Co.
Summers Fertilizer Co., Inc.
Woodward & Dickerson, Inc.

Nitrogen Solutions—Ammoniation

Alabama By-Products Corp.
American Cyanamid Co.
Ashcraft-Wilkinson Co.
H. J. Baker & Bro.
Bradley & Baker
Commercial Solvents Corp.
Lion Oil Co.
Nitrogen Div. Allied Chem. & Dye
Northern Chemical Industries, Inc.
Phillips Chemical Co.
Sohio Chemical Co.
Spencer Chemical Co.
Summers Fertilizer Co., Inc.
Woodward & Dickerson, Inc.

Nitrogen Solutions—Direct Application

Alabama By-Products Corp.
American Cyanamid Co.
Ashcraft-Wilkinson Co.
H. J. Baker & Bro.
Bradley & Baker
Commercial Solvents Corp.
Lion Oil Co.
Nitrogen Div. Allied Chem. & Dye
Northern Chemical Industries, Inc.
Sohio Chemical Co.
Summers Fertilizer Co., Inc.
Woodward & Dickerson, Inc.

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Woodward & Dickerson, Inc.

Organic Materials

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Bradley & Baker
Alex M. McIver & Sons
Smith-Rowland Co.
United Fertilizer Co.
Woodward & Dickerson, Inc.

Peanut Products

Ashcraft-Wilkinson Co.
Alex M. McIver & Son
Woodward & Dickerson, Inc.

Peat

Ashcraft-Wilkinson Co.
Atkins, Kroll & Co.

Phosphate, Calcinated

Coronet Phosphate Co.
Woodward & Dickerson, Inc.

Phosphate Rock

The American Agricultural Chemical Co.
American Cyanamid Co.
Armour Fertilizer Works
Ashcraft-Wilkinson Co.
Coronet Phosphate Co.
Davison Chemical Co.
International Minerals & Chemical Corp.
International Ore & Fertilizer Corp.
F. S. Royster Guano Co.
Woodward & Dickerson, Inc.

Phosphate Rock, Defluorinated

Coronet Phosphate Co.
Woodward & Dickerson, Inc.

Phosphates, Ammoniated

The American Agricultural Chemical Co.
Armour Fertilizer Works
Northern Chemical Industries, Inc.
Summers Fertilizer Co., Inc.
Woodward & Dickerson, Inc.

Phosphates, Colloidal

Ashcraft-Wilkinson Co.

Phosphoric Acid

The American Agricultural Chemical Co.
Ashcraft-Wilkinson Co.
Monsanto Chemical Co.
U. S. Phosphoric Products Div.

Phosphorus, Elemental

The American Agricultural Chemical Co.
Monsanto Chemical Co.

Phosphorus Pentasulfide

The American Agricultural Chemical Co.
Monsanto Chemical Co.

Phosphorus, Red

The American Agricultural Chemical Co.

Phosphorus Sesquisulfide

The American Agricultural Chemical Co.

Potash, Muriate

American Potash & Chemical Corp.
Armour Fertilizer Works
Ashcraft-Wilkinson Co.
Bradley & Baker
International Minerals & Chemical Corp.
International Ore & Fertilizer Corp.
Alex M. McIver & Son
Potash Import & Chemical Corp.
Potash Co. of America
Southwest Potash Corp.
United States Potash Co.
Woodward & Dickerson, Inc.

Potash, Muriate (Granular)

International Minerals & Chemical Corp.
Potash Co. of America

Potash, Muriate (Technical Grade)

Potash Co. of America

Potash, Nitrate

Woodward & Dickerson, Inc.

Potash Salts

American Potash & Chemical Corp.
Armour Fertilizer Works
Ashcraft-Wilkinson Co.
Bradley & Baker
Potash Co. of America
United States Potash Co.
Woodward & Dickerson, Inc.

Potash, Sulfate

American Potash & Chemical Corp.
Armour Fertilizer Works
International Minerals & Chemical Corp.
International Ore & Fertilizer Corp.
Alex M. McIver & Son
Potash Co. of America
Potash Import & Chemical Corp.
Woodward & Dickerson, Inc.

Potassium Phosphate

Monsanto Chemical Co.
Woodward & Dickerson, Inc.

Potassium Cyanate

American Cyanamid Co.

Potassium Silicofluoride

The American Agricultural Chemical Co.
Davison Chemical Co.
U. S. Phosphoric Products Div.
Woodward & Dickerson, Inc.

Rape Meal

Woodward & Dickerson, Inc.

Rice Hulls

Ashcraft-Wilkinson Co.
Atkins, Kroll & Co.
Alex M. McIver & Son
Woodward & Dickerson, Inc.

Rodenticides

American Cyanamid Co.

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The American Agricultural Chemical Co.
Ashcraft-Wilkinson Co.
Consolidated Chemical Industries
Monsanto Chemical Co.

Coke Oven
Sulphate of Ammonia
Ammonia Liquor

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New Brunswick, New Jersey

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Producing Centers

**REPRESENTATIVE ANALYSIS**

Calcium content —CaCO₃ value 52.47%
Magnesium content —CaCO₃ value 44.23%
Calcium Carbonate —Equivalence 96.70%

MAGNESIUM LIMESTONE

EACH TON OF MASCOT LIMESTONE
CONTAINS ABOUT

3.6 Lbs. Zinc
4.8 Lbs. Sulphur

.75 Lbs. Manganese
.05 Lbs. Copper

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Box 2389

Knoxville, Tenn.

Salt, Stock

International Minerals & Chemical Corp.

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International Ore & Fertilizer Corp.

Slag, Basic

Ashcraft-Wilkinson Co.
Woodward & Dickerson, Inc.

Sludge, Activated

Alex M. McIver & Son
Summers Fertilizer Co., Inc.
Woodward & Dickerson, Inc.

Sludge, Dried

Alex M. McIver & Son
Summers Fertilizer Co., Inc.
Woodward & Dickerson, Inc.

Soda Ash

Alex M. McIver & Son
Woodward & Dickerson, Inc.

Sodium Borate

Alex M. McIver & Son
Pacific Coast Borax Co.

Sodium Cyanamid

Woodward & Dickerson, Inc.

Sodium Fluosilicate

The American Agricultural Chemical Co.
Davison Chemical Co.
Northern Chemical Industries, Inc.
Summers Fertilizer Co., Inc.
U. S. Phosphoric Products Div.
Woodward & Dickerson, Inc.

Sodium Nitrate

The American Agricultural Chemical Co.
Armour Fertilizer Works
Nitrogen Div. Allied Chem. & Dye
F. S. Royster Guano Co.
Woodward & Dickerson, Inc.

Sodium Phosphate

The American Agricultural Chemical Co.
Monsanto Chemical Co.
Woodward & Dickerson, Inc.

Sulfate of Potash-Magnesia

Armour Fertilizer Works
Woodward & Dickerson, Inc.

Sulfate of Potash-Magnesia (Double)

International Minerals & Chemical Corp.

Sulfur

Ashcraft-Wilkinson Co.
Alex M. McIver & Son
Tennessee Corp.

Texas Gulf Sulphur Co., Inc.
U. S. Phosphoric Products Div.
Woodward & Dickerson, Inc.

Sulfuric Acid

The American Agricultural Chemical Co.
Armour Fertilizer Works
Ashcraft-Wilkinson Co.
Consolidated Chemical Industries
Davison Chemical Co.
International Minerals & Chemical
Lion Oil Co.
Alex M. McIver & Son
Monsanto Chemical Co.
Northern Chemical Industries, Inc.
Planters Fertilizer & Phosphate Co.
Robertson Chemical Corp.
F. S. Royster Guano Co.
Southern States Phos. & Fert. Co.
Summers Fertilizer Co., Inc.
Tennessee Corp.
U. S. Phosphoric Products Div.
Wilson & Toomer Fertilizer Co.

Superphosphate

The American Agricultural Chemical Co.
Armour Fertilizer Works
Ashcraft-Wilkinson Co.
H. J. Baker & Bro.
Davison Chemical Co.
International Minerals & Chemical
International Ore & Fertilizer Corp.
Alex M. McIver & Son
Northern Chemical Industries, Inc.
Planters Fertilizer & Phosphate Co.
Robertson Chemical Corp.
F. S. Royster Guano Co.
Southern States Phos. & Fert. Co.
Summers Fertilizer Co., Inc.
U. S. Phosphoric Products Div.
Wilson & Toomer Fertilizer Co.
Woodward & Dickerson, Inc.

Superphosphate, Ammoniated

The American Agricultural Chemical Co.
Armour Fertilizer Works
Ashcraft-Wilkinson Co.
Davison Chemical Co.
Alex M. McIver & Son
Northern Chemical Industries, Inc.
Planters Fertilizer & Phosphate Co.
Southern States Phos. & Fert. Co.
Summers Fertilizer Co., Inc.
Woodward & Dickerson, Inc.

Superphosphate, Concentrated

Armour Fertilizer Works
Bradley & Baker
Davison Chemical Co.
International Minerals & Chemical
Alex M. McIver & Son
Phillips Chemical Co.
Summers Fertilizer Co., Inc.
U. S. Phosphoric Products Div.
Woodard & Dickerson, Inc.

Superphosphate, Concentrated (Granular)

Davison Chemical Co.
International Minerals & Chemical

Superphosphate, Granular

Armour Fertilizer Works
Atkins, Kroll & Co.
Davison Chemical Co.
International Minerals & Chemical
U. S. Phosphoric Products Div.
Woodward & Dickerson, Inc.

Surfactants, Ionic

Monsanto Chemical Co.
Tennessee Corp.

Surfactants, Non-ionic

Monsanto Chemical Co.

Talc

Alex M. McIver & Son
Woodward & Dickerson, Inc.

Tankage

Ashcraft-Wilkinson Co.
H. J. Baker & Bro.
Bradley & Baker
Consolidated Chemical Industries
Alex M. McIver & Son
Smith-Rowland Co.
United Fertilizer Co.
Woodward & Dickerson, Inc.

Tobacco Stems

Ashcraft-Wilkinson Co.
Alex M. McIver & Son

Toluene

Nitrogen Products, Inc.
Woodward Iron Co.

Trace Element Compounds

Calumet Division
Pacific Coast Borax Co.
Tennessee Corp.

Trisodium Phosphate

The American Agricultural Chemical Co.
Monsanto Chemical Co.

Tung Products

Ashcraft-Wilkinson Co.
Alex M. McIver & Son
Woodward & Dickerson, Inc.

Urea

Armour Fertilizer Works
Atkins, Kroll & Co.
Bradley & Baker
Grace Chemical Company
Grand River Chemical Div.
Alex M. McIver & Son
Nitrogen Div. Allied Chem. & Dye
Sohio Chemical Co.
Woodward & Dickerson, Inc.

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Alex M. McIver & Son
Zonolite Co.

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Pacific Coast Borax Co.
Woodward & Dickerson, Inc.

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Nitrogen Products, Inc.
Woodward Iron Co.

Zinc Sulfate
Ashcraft-Wilkinson Co.
Atkins, Kroll & Co.
Alex M. McIver & Son
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The D. M. Weatherly Co.

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Law & Co.

Brokers, Domestic
Samuel D. Keim

Brokers, Export
H. J. Baker & Bro.
Bradley & Baker
Southern States Phosphate &
Fertilizer Co.

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Houston Laboratories
Law & Co.
Morris Testing Laboratories
Shuey & Co. Inc.
Wiley & Co., Inc.

Chemists, Consulting & Research
Law & Co.
Shuey & Co. Inc.
Wiley & Co. Inc.

Construction, Ammonia Plant
Chemical Construction Corp.
Fertilizer Construction Co., Inc.
The Fluor Corp. Ltd.
John J. Harte Co.
The Lummus Company
Luria Engineering Co.
The D. M. Weatherly Co.

SERVICES

Construction, Ammonium Nitrate Plant
Chemical Construction Corp.
The Chemical & Industrial Corp.
Fertilizer Construction Co., Inc.
The Fluor Corp. Ltd.
John J. Harte Co.
Luria Engineering Co.
The Lummus Company
The D. M. Weatherly Co.

Construction, Ammonium Nitrate Plant (CSC Stengel Process)
The Chemical & Industrial Corp.

Construction, Ammonium Nitrate Plant (Prilling Process)
The Chemical & Industrial Corp.

Construction, Ammonium Sulphate Plant
John J. Harte Co.

Construction, Buildings
Chemical Construction Corp.
The Chemical & Industrial Corp.
Chemical Construction Corp.
Fertilizer Construction Co., Inc.
John J. Harte Co.
Luria Engineering Co.
The A. J. Sackett & Sons Co.
The D. M. Weatherly Co.

Construction, Complex Fertilizer Plants (PEC Process)
The Chemical & Industrial Corp.

Construction, Electric Power
John J. Harte Co.

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Raleigh, N. C.
Statesville, N. C.
Wilmington, N. C.

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Delta Manufacturing Co.
Fertilizer Construction Co., Inc.
John J. Harte Co.
The Lummus Company
The A. J. Sackett & Sons Co.
Stedman Foundry & Machine Co.
Sturtevant Mill Co.
The D. M. Weatherly Co.

Construction, Granulation Process Plant

Davidson Kennedy Co.
The Fluor Corp. Ltd.

Construction, Insecticide Plant

John J. Harte Co.

Construction, Liquid Fertilizer Plant

Acme-Fisher Division
Chemical Construction Corp.
The Chemical & Industrial Corp.
Davidson Kennedy Co.
Fertilizer Construction Co., Inc.
The Fluor Corp. Ltd.
The Lummus Company
The D. M. Weatherly Co.

Construction, Mixed Fertilizer Plant

Chemical Construction Corp.
Davidson Kennedy Co.
Delta Manufacturing Co.
Fertilizer Construction Co., Inc.
The Fluor Corp. Ltd.
John J. Harte Co.
The Lummus Company
The A. J. Sackett & Sons Co.
Stedman Foundry & Machine Co.
Sturtevant Mill Co.
The D. M. Weatherly Co.

Construction, Mixed Fertilizer Plant (PEC Process)

The Chemical & Industrial Corp.

Construction, Nitric Acid Plant

Chemical Construction Corp.
The Chemical & Industrial Corp.
Fertilizer Construction Co., Inc.
The Fluor Corp. Ltd.
John J. Harte Co.
The Lummus Company
The D. M. Weatherly Co.

Construction, Nitrophosphate Plant

Chemical Construction Corp.
Fertilizer Construction Co., Inc.
The Fluor Corp. Ltd.
John J. Harte Co.
The Lummus Company
The A. J. Sackett & Sons Co.
The D. M. Weatherly Co.

Construction, Nitrophosphate Plant (PEC Process)

The Chemical & Industrial Corp.

Construction, Petrochemicals Plants

The Lummus Co.

Construction, Phosphoric Acid Plant

Chemical Construction Corp.
The Chemical & Industrial Corp.
Fertilizer Construction Co., Inc.
The Fluor Corp. Ltd.
John J. Harte Co.
The Lummus Co.
The D. M. Weatherly Co.

Construction, Refinery

The Lummus Co.

Construction, Storage Building

The Chemical & Industrial Corp.
Davidson Kennedy Co.
Fertilizer Construction Co., Inc.
The Fluor Corp. Ltd.
John J. Harte Co.
The Lummus Co.
Luria Engineering Co.

The A. J. Sackett & Sons Co.
The D. M. Weatherly Co.

Construction, Storage Silo

The Chemical & Industrial Corp.
Fertilizer Construction Co., Inc.
The Fluor Corp. Ltd.
The Lummus Co.

Construction, Sulphuric Acid Plant

Chemical Construction Corp.
The Chemical & Industrial Corp.
Davidson Kennedy Co.
Fertilizer Construction Co., Inc.
The Fluor Corp. Ltd.
John J. Harte Co.
Southern Lead Burning Co.
The D. M. Weatherly Co.

Construction, Superphosphate Plant

Chemical Construction Corp.
Davidson Kennedy Co.
Fertilizer Construction Co., Inc.
The Fluor Corp. Ltd.
John J. Harte Co.
The Lummus Co.
The A. J. Sackett & Sons Co.
Sturtevant Mill Co.
The D. M. Weatherly Co.

Construction, Urea Plant

Chemical Construction Corp.
Fertilizer Construction Co., Inc.
The Fluor Corp. Ltd.
John J. Harte Co.
The Lummus Co.

Construction, Water Supply

John J. Harte Co.

Consultants, Conveyor

Link-Belt Co.

Contractors, Engineering

Chemical Construction Corp.
The Chemical & Industrial Corp.
Davidson Kennedy Co.

ALEX. M. McIVER

Established 1915

H. H. McIVER

ALEX. M. McIVER & SON

BROKERS

SPECIALIZING

- SULPHURIC ACID
- CALCIUM AMMONIUM NITRATE 20.5% N.
- AMMONIATED BASE AND SUPERPHOSPHATE
- SULPHATE OF AMMONIA
- UREA—45½% & 46% NITROGEN

- CASTOR POMACE
- PHOSPHATE ROCK
- FERTILIZER CONDITIONERS
- HYNITE TANKAGE
- POTASH

Exclusive Sales Representatives

CHI-ORGANIC—CHICAGO ACTIVATED SLUDGE

Representatives: MORGAN BROTHERS BAG COMPANY

BURLAP BAGS — PAPER BAGS — COTTON BAGS

GROUND COTTON BUR ASH, 38/42% K₂O Potash

Peoples Office Building

Phones: — 3-4828 & 3-4829

Charleston, S. C.

"Since 1915 Your Most Efficient Channel For Sales and Purchases of Fertilizer Materials."

Delta Manufacturing Co.
Fertilizer Construction Co., Inc.
The Fluor Corp. Ltd.
John J. Harte Co.
The Lummus Co.
The A. J. Sackett & Sons Co.
The D. M. Weatherly Co.

Consultants, Design

Chemical Construction Corp.
Davidson Kennedy Co.
Fertilizer Construction Co., Inc.
The Fluor Corp. Ltd.
John J. Harte Co.
Law & Co.
Link-Belt Co.
The Lummus Co.
Luria Engineering Co.
The A. J. Sackett & Sons Co.
Stedman Foundry & Machine Co.
Sturtevant Mill Co.
The D. M. Weatherly Co.

Consultants, Power Transmission

Link-Belt Co.

Consultants, Process

Chemical Construction Corp.
Davidson Kennedy Co.
Fertilizer Construction Co., Inc.
The Fluor Corp. Ltd.
Law & Co. Link-Belt Co.
The Lummus Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.
Sturtevant Mill Co.
The D. M. Weatherly Co.

Engineers, Construction

Chemical Construction Corp.
Delta Manufacturing Co.
Fertilizer Construction Co., Inc.
The Fluor Corp. Ltd.
John J. Harte Co.
Link-Belt Co.
The Lummus Co.
Luria Engineering Co.
The A. J. Sackett & Sons Co.
Stedman Foundry & Machine Co.
The D. M. Weatherly Co.

Engineers, Consulting

Chemical Construction Corp.
Davidson Kennedy Co.
Delta Manufacturing Co.
Fertilizer Construction Co., Inc.
The Fluor Corp. Ltd.
John J. Harte Co.
Law & Co.
Link-Belt Co.
Edw. Renneburg & Sons Co.
The A. J. Sackett & Sons Co.
The D. M. Weatherly Co.

Engineers, Production

The Jeffrey Manufacturing Co.

Fabricators, Protective Coatings & Linings

Acme-Fisher Div.

Fabricators, Special Machinery
The Jeffrey Manufacturing Co.

Formula Service

Law & Co.

Formulators, Custom Mineral Mixtures

Tennessee Corp.

Formulators, Custom Pesticide

Law & Co.
Mackwin Co.

Importers, Contract

H. J. Baker & Bro.
Bradley & Baker
Samuel D. Keim
Southern States Phosphate & Fertilizer Co.

Manufacturing, Contract
The Jeffrey Manufacturing Co.

Mixing, Custom Fertilizer

Davidson Kennedy Co.
Fertilizer Construction Co., Inc.
The Lummus Co.
The A. J. Sackett & Sons Co.

Sales Agents, Fertilizer

Bradley & Baker
Southern States Phosphate & Fertilizer Co.

Sampling

Wiley & Co., Inc.

Weighing

Wiley & Co., Inc.

SUPPLIES

Bags, Burlap

Chase Bag Co.
Fulton Bag & Cotton Mills
Alex. M. McIver & Son
Werthan Bag Corp.

Bags, Cotton

Chase Bag Co.
Fulton Bag & Cotton Mills
Alex. M. McIver & Son
Werthan Bag Corp.

Bags, Laminated Paper

Albemarle Paper Manufacturing Co.
Chase Bag Co.
Chemical Packaging Corp.
Fulton Bag & Cotton Mills
Hammond Bag & Paper Co., Inc.
Kraft Bag Corp.
Alex. M. McIver & Son
The Raymond Bag Co.

Bags, Multiwall Paper—

Pasted Open-mouth

Albemarle Paper Manufacturing Co.
Chase Bag Co.
Fulton Bag & Cotton Mills
Hammond Bag & Paper Co., Inc.
Kraft Bag Corp.
Alex. M. McIver & Son
The Raymond Bag Co.
St. Regis Sales Corp.
Werthan Bag Corp.

Bags, Multiwall Paper—

Pasted Valve

Albemarle Paper Manufacturing Co.
Chase Bag Co.
Fulton Bag & Cotton Mills
Hammond Bag & Paper Co., Inc.
Kraft Bag Corp.
Alex. M. McIver & Son
The Raymond Bag Co.
St. Regis Sales Corp.

Bags, Multiwall Paper—

Sewn Open-mouth

Albemarle Paper Manufacturing Co.
Chase Bag Co.
Chemical Packaging Corp.
Fulton Bag & Cotton Mills
Hammond Bag & Paper Co., Inc.
Kraft Bag Corp.
Alex. M. McIver & Son
The Raymond Bag Co.
St. Regis Sales Corp.
Werthan Bag Corp.

Bags, Multiwall Paper—

Sewn Open-mouth (Flat)

Kraft Bag Corp.

Bags, Multiwall Paper—

Sewn Valve

Albemarle Paper Manufacturing Co.
Chase Bag Co.
Chemical Packaging Corp.
Fulton Bag & Cotton Mills
Hammond Bag & Paper Co., Inc.
Kraft Bag Corp.
Alex. M. McIver & Son
The Raymond Bag Co.
St. Regis Sales Corp.
Werthan Bag Corp.

Bags, Multiwall Paper—

Sewn Valve (Flat)

Kraft Bag Corp.

Bags, Paper

Chase Bag Co.
Chemical Packaging Corp.
Fulton Bag & Cotton Mills
Hammond Bag & Paper Co., Inc.
Kraft Bag Corp.
Alex. M. McIver & Son
The Raymond Bag Co.
St. Regis Sales Corp.
Werthan Bag Corp.

SHUEY & COMPANY, INC.

Specialty: Analysis of Fertilizers, fertilizer materials, feeds, minerals, waters and soils. Official Chemists for Florida Hard Rock Phosphate Export Association, Official weighers and Samplers for the National Cottonseed Products Association at Savannah; also Official Chemists for National Cottonseed Products Association.

115 E. Bay Street, Savannah, Georgia

Bags, Polyethylene-lined
Chase Bag Co.
Chemical Packaging Corp.
Fulton Bag & Cotton Mills
Hammond Bag & Paper Co., Inc.
The Raymond Bag Co.
St. Regis Sales Corp.
Werthan Bag Corp.

Bags, Laminated Textile
Chase Bag Co.
Fulton Bag & Cotton Mills

Bags, Waterproof Textile
Chase Bag Co.
Fulton Bag & Cotton Mills

Liners, Barrel & Drum
Chase Bag Co.
Fulton Bag & Cotton Mills
Werthan Bag Corp.

Liners, Bag
Chase Bag Co.
Werthan Bag Corp.

Tarpaulins
Fulton Bag & Cotton Mills

Tape, Bag Closing
Albemarle Paper Manufacturing Co.
St. Regis Sales Corp.
Werthan Bag Corp.

Thread, Bag Closing
Chase Bag Co.
Fulton Bag & Cotton Mills
St. Regis Sales Corp.
Werthan Bag Corp.

Ties, Bag Closing
Chase Bag Co.
Fulton Bag & Cotton Mills
St. Regis Sales Corp.
Werthan Bag Corp.

Twine, Bag Closing
Chase Bag Co.
Fulton Bag & Cotton Mills
Werthan Bag Corp.

Buyers Guide

Page numbers of advertisements for the firms listed in this section will be found on pages 200 and 201.

Abbe Engineering Company, Inc.
Kent Mill Division
544 Union Avenue
Brooklyn, N. Y.
Crushing, Grinding, Pulverizing,
Mixing, Sifting and Air Separating
Machinery.

Acme-Fisher Division
Broadway Rubber Corporation
529 E. Broadway
Louisville 2, Ky.
Liquid fertilizer systems completely
engineered and installed; rubber
lined tanks for phosphoric acid and
nitrogen solutions; dust control sys-
tems; liquid plant food applicators;
liquid mixing agitators; lead coils;
acid handling systems; mixers—li-
quid, paddle and ribbon; pumps—
acid and corrosion-resistant; plastic
and rubber chemical equipment;
pipe; valves; tanks—steel, rubber-
lined and plastic-lined; shop and
field work on specialized linings of
various rubber membranes on
tanks, pipe, valves, fittings, ducts,
etc.

Alabama By-Products Corporation
P. O. Box 354
Birmingham, Alabama
Manufactures Sulphate of Am-
monia for shipment in bulk or in
bags. Sales Agents for Ketona An-
hydrous Ammonia and Ketona Ni-
trogen Solutions.

The Albemarle Paper Manufacturing Company
P. O. Box 2189
Richmond 17, Va.
Manufacturers of Multiwall Paper
Bags.

Allen Scale Company
774 Murphy Ave., S. W.
Atlanta 3, Georgia
Scales, Special Scale Fabrications,
Scale Repair.

Allied Chemical & Dye Corp.
(See Nitrogen Division)

The American Agricultural Chemical Company
50 Church St.
New York 7, N. Y.
Factories & Sales Offices:
Alexandria, Va. (A)—Baltimore,
Md. (AE)—Buffalo, N. Y. (A)—
Cairo (P. O. Box 158, Lima), Ohio
(B)—Carteret, N. J. (AE)—Cayce,
S. C. (A)—Charleston, S. C. (A)—
Cincinnati, Ohio (A)—Cleveland,
Ohio (A)—Columbia, S. C., Sales
Office Only—Detroit, Mich., (AE)
—E. St. Louis, Ill. (A)—Ft. Cham-
bly, Quebec, Canada (C)—Fulton,
Ill. (A)—Greensboro, N. C. (A)—
Havana, Cuba, (C)—Henderson, N.
C. (C)—Houlton, Maine, Sales Of-
fice Only—Humboldt, Iowa (A)—
Montgomery, Ala. (A)—Norfolk,

WERTHAN "BETTER BUILT BAGS"

BURLAP AND COTTON BAGS — PRINTS AND REGULAR
MULTIWALL PAPER BAGS—SEWING THREAD AND TWINE
ALSO PROCESSORS OF USED BAGS



WERTHAN BAG CORPORATION

NASHVILLE 1, TENNESSEE

FACTORIES: NASHVILLE - NEW ORLEANS

Va. (C)—No. Weymouth, Mass. (AE)—Pensacola, Fla. (A)—Pierce, Fla. (A)—Port Hope, Ontario, Canada (C)—Saginaw, Mich. (B)—Savannah, Ga. (AE)—Searsport, Me. (C)—Spartanburg, S. C. (C)—Three Rivers, (Post Office, Phoenix) N. Y. (C)—Washington Court House, Ohio (B).

Commercial Fertilizers, Superphosphate, Ground Phosphate Rock, Agrinite Tankage, Animal Bone Charcoal, Bone Black Pigments (Cosmic Black), Bone Ash, Bone Oil, Precipitated Bone Phosphate, Gelatin, Agricultural Insecticides (including Pyrox, Arsenate of Lead, Calcium Arsenate, etc.), Phosphodust, Trisodium and Disodium Phosphate, Phos-Feed Brand Dicalcium Phosphate, Phosphoric Acid, Sulphuric Acid, Ammonium Carbonate, Ammonium Silicofluoride, Magnesium Silicofluoride, Potassium Silicofluoride, Magnesium Fluoride, Silicofluoride Mixtures, Zinc, Silicofluoride, Sodium Fluoride, Sodium Silicofluoride, Ammonium Fluoborate, Elemental and Red Phosphorus, Phosphorus Pentasulphide, Ferro-Phosphorus, Phosphorus Sesquisulphide, Salt Cake; Dealers in: Nitrate of Soda, Sulphate of Ammonia, Cyanamid, Raw Bone Meal, Steamed Bone Meal, Potash Salts. We mine and sell all grades of Florida Pebble Phosphate Rock.

American Cyanamid Company
Agricultural Chemicals Division
30 Rockefeller Plaza
New York 20, N. Y.

Nitrogen Fertilizers: Calcium Cyanamid, Granular and Pulverized, and Ammonium Nitrate. Anhydrous Ammonia, Sulfate of Ammonia and Nitrogen Solutions. Florida Natural Phosphate Rock for acidulation and direct application. Defoliant: Calcium Cyanamid and Amino Triazole. Weedkillers, Chemical Soil Conditioners, Insecticides, and Fungicides.

American Limestone Company
P. O. Box 2389
Knoxville, Tennessee
Magnesium Limestone.

American Potash & Chemical Corp.
3030 W. 6th St.
Los Angeles 54, Calif.

Agricultural Pentahydrate Borax—44% B²O³ guaranteed minimum. Borax—36.5% B²O³ (Guaranteed 99.5% pure). Dehydrated Borax—68.5% B₂O₃. Muriate of Potash—60% Grade. Sulphate of Potash—50% Grade.

Armour Fertilizer Works
350 Hurt Building
P. O. Box 1685
Atlanta 1, Georgia

Complete Fertilizers, Fertilizer Materials, Phosphate Rock, Superphosphate, Triple Superphosphate, Sheep Manure.

Ashcraft-Wilkinson Company
Trust Company of Ga. Bldg.
Atlanta, Ga.

Fertilizer Materials, Cottonseed Products, Sulphate of Ammonia, Calcium Ammonium Nitrate, Ammonium Sulphate Nitrate, Nitrate

of Lime, urea. Organic Ammoniates, Vegetable Meals and Feed Stuffs, Sulphur, Potash, All Grades Bone Meal, including Raw-Steamed and Feeding, Fish Meal, Liver Meal, Ammoniated Phosphate, Triple Superphosphates, Phosphate Rock, Phosphate Rock Floats, Blood and tankage, both domestic and foreign nitrogenous tankage, Limestone, Crude Ground Sulphur, Agricultural Insecticides and Chemicals, Base Goods Fillers & Conditioners, Agricultural Gypsum Borate.

Atkins, Kroll & Company
417 Montgomery St.
San Francisco, California

Urea, Superphosphates, Triple Superphosphate, Calcium Ammonium Nitrate, Ammonium Phosphates, Bloodmeal, Tankage, Fishmeal.

The Atlanta Utility Works
East Point, Ga.

Assembly Hopper Units, Acidulating Units, Architects & Engineers, Bagging Machines, Bagging Units, Basing Units, Bin Valves, Bucket Elevators (steel) Buckets, Carts, (Fertilizer), Cluster Hoppers, Complete Fertilizer Plants, Complete Mixing Units, Complete Superphosphate Plants, Continuous Ammoniators, Continuous Acidulating Process Conveying Machinery, Conveyor Systems, Dens & Excavators, Dry Mixers, Dry Mixing Units, Elevator Casings (steel), Fertilizer Batching Hoppers & Mixing Equipment, Fertilizer Machinery, Head Breakers, Machinery, Conveying Mixers, Acid Phosphate, Mixers, Dry Mixing Machinery, Mixing Units, Multiple Hopper Batching Systems, Plant Mechanization Systems, Rotary Batch Mixers, Sacking Units, Scales, Shipping Units, Shuttle Belt Conveying Systems, Swing Bar Pulverizers, Tailing Mill, Weighing Hoppers.

H. J. Baker and Bro.

600 Fifth Ave.
New York 20, N. Y.

Castor Meal, Vegetable Oil Meals (Feed and Fertilizer), Fish Meal & Scrap, Fertilizer and Feed, Potash, Nitrogenous materials, Packing House By-Products, Liquid and Solid Nitrogen, Ammonium Sulphate Nitrate (ASN), Calcium Ammonium Nitrate (Montansalpetre), Nitrogenic Tankage (Chicago Sludge), Hou-Actinite (Houston, Texas Sludge), Cocoa Tankage, Poultry Manure, Garbage Tankage, Superphosphate.

Baldwin Foundry & Machine Corp.
(formerly Spalding Foundry Co.)

P. O. Box 1082
Atlanta 1, Georgia

Founders, Machinists and Engineers. Fertilizer machinery, repairs and replacements. Gears, sprockets, pinions, bearings, hopper valves and bag holders.

Bradley & Baker

155 East 44th Street
New York, N. Y.

Offices: Baltimore, Jacksonville, St. Louis, Indianapolis, Houston, Atlanta, Norfolk.
Manufacturer's Agents, Importers-

Exporters Fertilizer Material & Feedstuffs, Calcium Nitrate, Dicalcium Phosphate, Muriate of Potash, Natural Organic Nitrogen, Nitrogenous Materials, Nitrogenous Tankage, Nitrolime (name accepted in official directory of Fertilizer Materials) Potash Materials, Sulphate of Ammonia, Triple Superphosphate; Urea; Anhydrous Ammonia; Ammonium Nitrate Limestone; Nitrogen Solutions—Ammoniation & Direct Application; Nitrophosphate.

Broadway Rubber Corporation

(See Acme-Fisher Division)

Calumet Division

1 Calumet Ave.

Calumet, Michigan

Copper Oxide—Fertilizer Grade; Copper Oxide—Spray Grade; Copper Oxide—Feed Grade.

Charlotte Tank Corporation

P. O. Box 8307

Charlotte 8, North Carolina

Manufacturers of ammonia applicator tanks and ammonia storage tanks from 65 gallons to 1000 gallons water capacity; 65 gallon applicator tanks, 100 gallon applicator tanks, 150 gallon applicator tanks, 300 gallon storage tanks, 500 gallon storage tanks, 1000 gallon storage tanks. Manufactured to a designed working pressure of 265 lbs. and stamped under the jurisdiction of the ASME Code. Each tank is equipped with a complete set of steel fittings. Designers and Builders of Correctly Engineered Tank Trucks.

Chase Bag Company

309 West Jackson Blvd.

Chicago, Illinois

Manufacturers of Multiwall paper bags, Crinkled paper bags and liners, Polyethylene bags and liners, Burlap, Cotton Bags.

The Chemical and Industrial Corp.

256 McCullough St.

Cincinnati 28, Ohio

Designers and Builders of Fertilizer and Chemical Plants, Nitric acid plants (high pressure process); ammonium nitrate plants (Stengel process—ammoniated solutions; prilling process); complex fertilizers—PEC process (nitric phosphate—ammonium phosphate). Building and storage facility construction. Granulation plants; sulfuric and phosphoric acid plants; liquid fertilizer plants.

Chemical Construction Corporation

525 West 43rd St.

New York, 36, N. Y.

Synthetic Ammonia Plants—Ammonium Nitrate Plants—Ammonium Sulfate Plants—Nitrogen Solutions Plants—Contact Sulfuric Acid Plants—Double and Triple Superphosphate Plants—Sulfuric Acid Concentrators—Phosphoric Acid Plants—Phosphoric Acid Concentrators—Ammonia Oxidation Units—Urea Plants.

Chemical Packaging Corporation

P. O. Box 178

Savannah, Georgia

Manufacturers of Multiwall Paper Bags.

R. D. Cole Manufacturing Co.
Newnan, Georgia
Manufacturers of Steel and Aluminum Storage Tanks, Boilers, Coolers and Liquid Mixing Tanks. Tanks for acid, ammonia and nitrogen solutions storage & transport. Rotary Coolers, gas & oil fired.

Combustion Engineering, Inc.
Raymond Division
1317 N. Branch St.
Chicago 22, Ill.
Roller Mills with Air Separation Mechanical Air Separators Bowl Mills for Pulverized Fuel. Laboratory Equipment. Flash Drying Systems.

Commercial Solvents Corporation
Agricultural Chemicals Department
260 Madison Ave.
New York 16, N. Y.
Anhydrous Ammonia, nitrogen solutions, solid ammonium nitrate, aqua ammonia, insecticides (Benzene Hexachloride, Dieldrin).

Consolidated Chemical Industries, Inc.
640 Esperson Building
Houston, Texas
380 Madison Ave., New York, N. Y.
111 Sutter St., San Francisco, Calif.
Plants: LeMoyné, Ala.; Little Rock, Ark.; Bayshore, Calif.; Bastrop, Baton Rouge & Springhill, La.; Woburn, Mass.; Baytown, Ft. Worth & Houston, Texas.
Sulphuric Acid, Bone Meal, Fertilizers, Tankage, etc.

Continental Gin Company
Industrial Division
P. O. Box 2614
Birmingham, Alabama
Conveyors: All Types—Belt, Chain, Screw, Flight; Belt Trippers; Belt Aligners; Belt Pulleys; Belt Conveyor Idlers; Belt Plows; Belt Take-ups; Conveyor Belting; Screw Conveyors; Helicoid & Sectional; Feeders: Belt, Plant, Screw, Reciprocating, Vane, Apron Heavy Duty Cast Manganese; Screw Elevators; Elevators: Belt, Chain, Centrifugal Discharge, Continuous, Super-Capacity, Perfect Discharge, Bucket; Elevator Buckets; Elevator Chains; Power Transmission Equipment; Bearings, Pulleys, V-Belt Drivers, Chain Drives, Shafting, Collars, Clutches, Speed Reducers; Gear-motors; Drive Belts.

Coronet Phosphate Co.
(A Division of Smith-Douglass Co., Inc.)
P. O. Box 29
Norfolk 1, Va.
Phosphate Mines: Florida. Phosphate Miners, Phosphate, Phosphate Rock, Defluorinated Phosphate Rock.

Cunningham Electronic Selecting
Check Scales
2213 Tubman Home Road
Augusta, Georgia
Check scales to sort underweight and overweight bags on conveyor line, electronically operated. Scale seals for prevention of damage to weighing mechanism.

Davidson-Kennedy Company
1090 Jefferson Street, N.W.
P. O. Box 97, Station "D"
Atlanta, Georgia
Manufacturers and Engineers. Complete fertilizer dry mix plants, complete granulation plants and complete superphosphate plants, cluster hoppers, automatic nitrogen solution tanks, automatic anhydrous ammonia tanks, vibrating screens, pulverizers, foot breakers, bucket elevators, belt conveyors, head breakers, continuous ammoniators, continuous superphosphate dens, cone mixers, rotary coolers, rotary dryers, scales, constant weight feeders, fume scrubbers, cyclone dust collectors, automatic control equipment.

Davidson Chemical Company
Division of W. R. Grace & Co.
Davison Chemical Building
101 North Charles Street
Baltimore 2, Maryland
Manufacturers of: Triple superphosphate, both Run-of-Pile and Granulated, guaranteed minimum 45% APA; single superphosphate, both Run-of-Pile and Granulated, guaranteed minimum 20%; Granulated Mixed Fertilizers; Phosphate Rock, all grades; Sulphuric Acid; Chemical Fertilizer Conditioners; Complete Fertilizers—regular, granular and soluble; Fungicides; Insecticides—formulations, packaged and technical; Potassium Silicofluoride; and Sodium Fluosilicate.

Deere & Company
(See Grand River Chemical Division)

Delta Manufacturing Company
P. O. Box 125
Sioux City, Iowa
Engineers and Consultants; Constructors of Granulation plants and Mixed Fertilizer plants; Mixers, Hoppers, Clod Breakers, Conveyors, Elevators, Dryers and Coolers.

Evans Metal Company
P. O. Box 97—North Side Branch
Atlanta, Ga.
Manufacturers of Chemical sheet lead, lead pipe and antimonial lead pipe for the chemical trade.

Fertilizer Construction Company, Inc.
(Associated with Fertilizer Engineering & Equipment Co., Inc.)
Memorial Drive
Green Bay, Wisc.
Architects; Plant Construction—all types and units of fertilizer plants; Engineering Contractors; Design & Process Consultants; Construction & Consulting Engineers.

Fertilizer Engineering & Equipment Company
Memorial Drive Green Bay, Wisc.
Equipment Manufacturers for the Fertilizer Industry. Acidulating equipment, Batch Weighing Systems, Mixing and ammoniating equipment (TVA & ribbon continuous ammoniators), Elevating and Conveying, Bagging and Shipping, Granulating (Complete Granulating Units). Acid handling equipment, air ram gates, ammonia and acid storage tanks, ammonia service air compressors, bagging machines, batch and bag counters, box car

loaders, Bin vibrators, batch and continuous mixers, bucket elevators, car pullers, chain and attachments clod breakers, conveyor belting, coolers, dryers, dial or beam scales, dust collecting systems, electric gates, Elevator buckets and chain fans for HF fumes, flowrators, fume scrubbers, hopper level indicators, hoppers, chutes and spouts manual lever gates, open and TE motors, 1-1½-2 ton unit pulverizers, rock dust silos, sulfuric acid pumps, side and bottom discharge cards, starters, switches and controls, 30-60 TPH screens, sprockets, skip hoists, tractors, valves, Vibrators (Air & Elec.) Weigh larries.

Fertilizer Equipment Sales Corporation
130 Krog Street, N.E.
Atlanta, Georgia
Acidulation units (Cone Mixers), Bagging Units, Basing Units, Breakers, Bucket Elevators, Complete Fertilizer Plants, Cluster Hoppers, Conveyors, Continuous Ammoniation Equipment, Dryers, Feeders, Mixers, Automatic Measuring Tanks for Nitrogen Solution, Anhydrous and Sulphuric Acid.

The Fluor Corp., Ltd.
2500 S. Atlantic Blvd.
Los Angeles 22, Calif.
District Sales Offices—589 Fifth Ave., New York 17, N. Y.; 20 N. Wacker Dr., Chicago 6, Ill.; 1594 Houston Club Bldg., Houston 2, Tex.; Equitable Life Bldg., San Francisco, Calif.; 229 Mayo Bldg., Tulsa 3, Okla.; 1518 Walnut St., Philadelphia, Pa.; 556 Denver Club Bldg., Denver, Colo.; 900 Wilshire Blvd., Los Angeles 17, Calif.
Affiliates in: New York, N. Y.; Toronto, Ont., Can.; Calgary, Alta., Can.; Niagara Falls, Ont., Can.
Representatives in: Boston, Mass.; Buffalo, N. Y.; Pittsburgh, Pa.; Birmingham, Ala.; Detroit, Mich.; Minneapolis, Minn.
Construction and design: fertilizer and chemical process plants, storage facilities. Engineers. Design and process consultants.

Fulton Bag & Cotton Mills
170 Boulevard, S.E.
Atlanta, Ga.
Plants at: Atlanta, Ga.; Dallas, Tex.; Denver, Colo.; Kansas City, Kans.; Los Angeles, Calif.; Minneapolis, Minn.; New Orleans, La.; St. Louis, Mo.; Savannah, Ga.
Sales Offices at: Chicago, Ill.; Oklahoma City, Okla.; New York, N. Y.; Phoenix, Ariz.; San Francisco, Calif.; Winter Haven, Fla.
Manufacturers of: Cotton, Burlap, Multiwall Paper & Waterproof Paper Lined Textile Bags; Used Bags; Bagging; Bag Closing Twine Thread; Tarpaulins.

General American Transportation Corporation
Process Equipment Division
139 South Fourth Street
Louisville 2, Kentucky
Dryer sales office: 380 Madison Ave., New York 17, New York
Rotary Dryers; Rotary Coolers; Fatty Acid Distillation Units; Electrolyzers.



Producers of
Agricultural Grade

MURIATE OF POTASH

A dependable source of supply
for your Potash requirements.

POTASH COMPANY OF AMERICA

Carlsbad, New Mexico

General Sales Office . . . 1625 Eye Street, N.W., Washington, D. C.

Midwestern Sales Office . . . First National Bank Bldg., Peoria, Ill.

Southern Sales Office . . . Candler Building, Atlanta, Ga.

General Metals, Inc.

P. O. Box 448
Greensboro, N. C.
Complete line of equipment for handling liquid nitrogen from the tank car to the soil; Tanks (storage, nurse, trailer, tractor); Complete Transport Units; Equipment for surface and subsurface application. Aluminum and stainless steel valves, fittings, pipe, compressors, rupture discs and strainers.

Gilman Paper Company
(See Kraft Bag Corporation)

Grace Chemical Company
P. O. Box 4906, North Station
Memphis, Tennessee
Branch Sales Offices: 3 Hanover Square, New York; 75 East Wacker Drive, Chicago; 1401 Peachtree St., N.E., Atlanta.
Manufacturers of Anhydrous Ammonia, Aqua Ammonia and Urea.

Grand River Chemical Division
Deere & Company
2010 S. Utica
Tulsa 4, Oklahoma
Nitrogen fertilizers: Anhydrous Ammonia, Urea.

Hammond Bag & Paper Company, Inc.
General Office, Wellsburg, W. Va.
Plants at Wellsburg, W. Va.; Pine Bluff, Ark.; Charlotte, N. C.; and Palatka, Fla.
Manufacturers of Multiwall Bags (and/or) Paper Bags for Fertilizers, Insecticides and Heavy Chemicals.

John J. Harte Company
284 Techwood Drive, N. W.
Atlanta, Georgia
Engineers — Designers — Constructors; Fertilizer Plants, Superphosphate, Triple Super, Granulation Processes, Nitrophosphate; Nitric, Sulfuric and Phosphoric Acid; Ammonia and Urea; Ammonium Nitrate, Ammonium Sulphate; Insecticides. Warehouse and Manufacturing Buildings, Office Buildings, Water Supply, Electric Power.

Houston Laboratories
311 Chenevert St.
P. O. Box 132
Houston, Texas
Analyses of Agricultural and Industrial Materials.

Hydrocarbon Products Co., Inc.
500 Fifth Ave.
New York 36, N. Y.
Ammonia Anhydrous; Ammonia Aqua; Ammoniates; Ammonium Sulphate.

Hyster Company
2941 N. E. Clackamas Street
Portland 8, Oregon
Plants also at: Peoria, Ill.; Danville, Ill.; Nijmegen, The Netherlands.
Manufacturers of a complete line of materials handling equipment in capacities from 1 to 30,000 lbs. Fork lift trucks, straddle carriers, mobile cranes, etc.

Industrial Marking Equipment Co., Inc.
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Brooklyn 17, N. Y.
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& Dating Equipment; Case Numbering Devices; Corrugated Container Printers; Conveyor Line Marking Attachments.

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Chicago 5, Illinois
Complete Fertilizers. Standard grades. Multiple strength grades. Superphosphates. Sulfuric Acid. Florida Pebble Phosphate 77%—75%—72%—70%—68%. Tennessee Phosphate 65%—60% Muriate of Potash 60% K₂O Granular Muriate of potash 50% K₂O Sul-Po-Mag** (Double Sulfate of Potash-Magnesia). Sulfate of Potash 50% K₂O—Stock Salt.
**Trade Mark Reg. U. S. Pat. Off.

International Ore & Fertilizer Corporation
500 Fifth Ave.
New York 36, N. Y.
Superphosphates, Ammonium Sulphate, Ammonium Phosphate, Ammonium Nitrate, Calcium Ammonium Nitrate, Calcium Nitrate, Mixed Fertilizers, Muriate of Potash, Sulphate of Potash, Phosphate Rock, Seeds and Feeds.

The Jeffrey Manufacturing Company
939 N. 4th St.
Columbus 16, Ohio
Offices: Beckley, W. Va.; Birmingham 3; Boston 16, Buffalo 2; Chicago 1; Cincinnati 2; Cleveland 15; Denver 2; Detroit 13; Duluth 2; Harlan, Ky.; Houston 2; Jacksonville 2; Milwaukee 2; New York 7; Philadelphia 3; Pittsburgh 22; Raleigh, N. C.; St. Louis 1; Salt Lake City 1; San Francisco 2; Montreal, Toronto and Hamilton, Canada.
Conveyors (apron, belt, chain, pan, pivoted bucket, spiral, trolley, V-bucket (electric and mechanical vibrating); Chains and Sprockets (for conveying, elevating and driving purposes); Crushers and Pulverizers (for reducing limestone, bones, shells, phosphate rock, tankage, alum cake, meat scrap and fish scrap); Elevators (bucket types—inclined or vertical, buckets continuous or intermittently spaced); Car Pullers; Feeders (apron, reciprocating plate and electric vibrating types); Electric Vibrating conveyors, screens, dryers, coolers and packers; Accurate gravimetric feeders for batching, proportioning and feeding; Self-propelled Digger-Loaders (for superphosphates); Pillow Blocks, Takeups, Couplings, Pulleys, Gears; Skip Hoists; Weigh Larries; Monoveyor Systems; Bag Elevators; Belt Idlers; Elevator Boots; Elevator Casings; Chutes, Bins, Bin Valves; Garbage Grinders; Dried Sludge Grinders; Grit Washers; Hammermills; Bone and Meat Hashers; Track Hoppers.

Johns-Manville Corporation
Celite Products Division
22 East 40th Street
New York 16, New York
Celite* mineral fillers; diluents; mineral fertilizer anti-caking conditioners.
*Trade mark registered.

Samuel D. Keim
604 Liberty Trust Building
Philadelphia 7, Pa.
Feeding and Fertilizer Materials.

Kent Mill Division
(See Abbe Engineering Co., Inc.)

The Kraft Bag Corporation
630 5th Ave.
New York 20, N. Y.
Western Sales Office: Daily News Bldg., Chicago 6, Ill.
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Law & Company
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Atlanta 1, Georgia
Consulting and Analytical Fertilizer Chemists.

Link-Belt Company
307 North Michigan Ave.
Chicago 1, Illinois
Offices: Albany 6; Atlanta; Baltimore 18; Birmingham 3; Boston 15, Buffalo 3; Charlotte 2; N. C.; Chicago 9; Cincinnati 2; Cleveland 15; Dallas 21; Denver 2 (Schloss & Shubart); Detroit 4; Duluth 2; Grand Rapids 7; Houston 1; Huntington 1; W. Va.; Indianapolis 6; Jacksonville 2; Kansas City 8, Mo.; Los Angeles 33; Louisville 2; Milwaukee 3; Minneapolis 5; Moline, Ill.; Newark 8, N. J.; New Orleans (R. J. Tricon Co.); New York 7; Oakland 7, Calif.; Philadelphia 40; Pittsburgh 13; Portland 9, Ore.; St. Louis 1; Salt Lake City 1; San Francisco 24; Seattle 4; Spokane 1; Washington 1, D. C.; Wilmington 43, Del.—In Canada: Link-Belt Limited: Halifax, N. S. (Austen Bros. Ltd.); Hamilton; Montreal 15; Swastika, Ont.; Sydney, N. S. (Austen Bros. Ltd.); Toronto 13; Vancouver 12; Winnipeg 10.—In Africa: Link-Belt Africa Limited: Springs —In Australia: Link-Belt Company Pty. Limited: Marrickville. Distributors and Representatives throughout the world.
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moniating); Machinery (Crushing); Machinery (Elevating); Machinery (For Handling Materials); Machinery (For Power Transmission); Mixers (Continuous); Mixing Machinery; Nodulizers; Pillow Blocks; Plant Mechanization Systems; Pullers; Pullers, Car; Reducer Units (Speed); Roll Crushers; Scoops, Power Unloading; Screens; Shakers, Car; Shuttle Belt Conveying Systems; Silent Chain Drives; Skip Hoists; Special Fabrications; Speed Reducer Units; Sprockets; Take-Ups; Unloading Scoops, Power; Urea Plants; Variable Speed Drives; Vibrating Screens; Weigh Larries; Winches (For Shifting Cars).

Lion Oil Company

El Dorado, Arkansas

Anhydrous Ammonia-Commercial Grade; Aqua Ammonia; Ammonium Nitrate Fertilizer, minimum 33.5% N.; Nitrogen Fertilizer Solutions #1, #2 and #3. Sulphate of Ammonia, Minimum 21% N.; Sulphuric Acid; Nitric Acid; Herbicides (technical).

Louisville Dryers

(see General American Transportation Corporation)

The Lummus Company

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New York 17, N. Y.**

Engineering & Sales offices: New York, Houston, Montreal, London, Paris, The Hague, Bombay.

Sales offices: Chicago, Caracas.

Designers and constructors of plants for production of: anhydrous ammonia, nitric and sulfuric acid, nitrogen solutions, ammonium phosphate and chlorides, ammonium and calcium nitrates, potassium nitrate, urea, complete agricultural chemical fertilizers by continuous processing, simple and triple superphosphates, all kinds of mixed fertilizers and fertilizer compounds.

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District offices: Atlanta, Philadelphia, Boston, Chicago, Washington, D. C.

Fertilizer Plants; Storage Buildings; Standardized Structural Steel Buildings.

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The Mackwin Company

Winona, Minnesota

Aldrin, chlordane, dieldrin, and

heptachlor granular and oil solution formulations.

Marble Products Company of Georgia

734 First National Bank Bldg.

Atlanta 3, Georgia

Dolomitic Limestone and High-Calcium Limestone.

Minco Products Corporation

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Saginaw, Michigan

Manufacturers of Granulating Bond, Fertilizer Conditioner and Dilvents.

Monsanto Chemical Company

Inorganic Chemicals Division

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St. Louis 4, Mo.

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Morris Testing Laboratories

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P. O. Box 803

Macon, Georgia

Analysts and Consulting Chemists.

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Atlanta Branch Office

P. O. Box 7008, Station "C"

Atlanta, Ga.

Acid handling products, Babbitt metals, Chemical sheet lead, Lead pipe, Burning bar, Hard lead and Lead-lined equipment.

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New York 6, N. Y.

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Nitrogen Products, Inc.

National Bank Bldg.

New Brunswick, N. J.

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Home office: Totman Bldg.

210 E. Redwood St.

Baltimore 2, Md.

Plant: Searsport, Maine

Manufacturers of Anhydrous Ammonia—Nitric Acid—Ammonium Nitrate Solutions—Sulphuric Acid—Superphosphate—Base Goods—Ammoniated Superphosphate—Sodium Silico Fluoride—Sulphate of Ammonia—and Liquid Alum (Paper Makers Grade).

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Division of Borax Consolidated

100 Park Ave.

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2295 Lumber Street

Chicago 16, Illinois

630 Shatto Place

Los Angeles 5, Calif.

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Phillips Chemical Company

Adams Bldg.

Bartlesville, Okla.

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Planters Fertilizer & Phosphate Co.

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Also: Charlotte, N. C.

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Merchandise Mart Plaza

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Baltimore 24, Md.

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P. O. Drawer 1940
Norfolk 1, Va.

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Smith-Rowland Company

Division of Smith Douglass Co., Inc.
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Sohio Chemical Company

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Lima, Ohio
Anhydrous Ammonia; Aqua Ammonia (Grade A, "B" Liquor); Ammoniating Solutions: Ammonia-Ammonium Nitrate Solutions, Ammonia-Ammonium Nitrate-Urea Solutions, Ammonia-Urea Solutions, Ammonium Nitrate-Urea Solutions, Ammonium Nitrate Solutions; Urea Solutions; Nitric Acid; Urea, Prilled (Fertilizer, Feed and Industrial).

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Southwest Potash Corporation

61 Broadway
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Muriate of Potash

Spalding Foundry Co.

(see Baldwin Foundry & Machine Corp.)

Spencer Chemical Company

Dwight Building
Kansas City 5, Mo.
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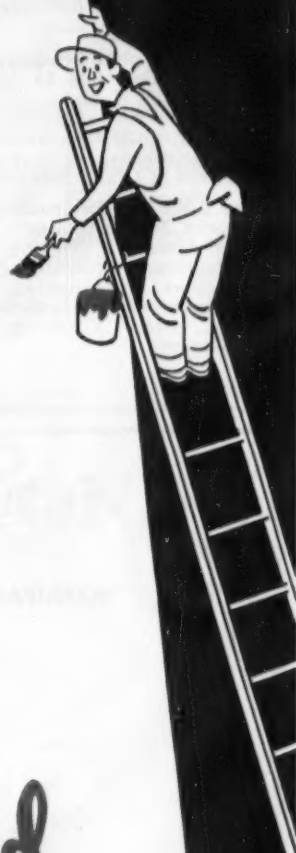
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Producers of Crude Sulphur.

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United Fertilizer Company
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United States Steel Corporation
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Analytical and Consulting Chemists.

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Woodward and Dickerson, Inc.

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Woodward, Alabama

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Worthington Corporation

Industrial Mixer Division

Dept. F-2

Plainfield, N. J.

Industrial Mixers for Fertilizers—Batch, Dry and Rotary; air compressors (all types); pumps (all types).

Zonolite Company

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2. Carrier for Agricultural Chemicals.

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